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Commercial Research

TECHNICAL research has long been considered a matter of first importance for railway engineering development, but commercial research, such as is being carried out on the L.M.S.R. by the Commercial Research Section of the Chief Commercial Manager's Department, is quite a new conception. As will be seen from the description, given on page 286, of the system of research followed by the section, its purpose is to pursue on a scientific basis free inquiry and experiment into all branches of railway activity that may in any way affect the interests of the commercial department. Naturally such work requires a specialised staff, the members of which need not only to possess an aptitude for analysing present practices and formulating theories, but also to have the necessary experience which will enable them to carry out practical experiments to test the fruits of their research. The success or failure of the section depends solely upon the ability of its personnel, as the work upon which it is engaged is entirely divorced from routine or set methods. Although the section is quite a recent innovation it has already fully justified its existence by successfully exploring a number of questions such as seat reservations, passenger train services, and low temperature freight traffic with most useful results.

The Peak Problem

Both Mr. E. Falconer, in his paper to the Institute of Transport on goods shed operation (reported on page 306), and those who took part in the subsequent discussion, made it clear that the fundamental obstacle in the way of economical working is the peak traffic problem. The occurrence of sharply defined peaks is a phenomenon which has become a characteristic of many phases of modern life, and contributes substantially to the difficulties with which both corporations and individuals are faced nowadays. The corporation must plan output to deal with peak demands, which means that, during a great part of the time, plant and equipment is idle or working below capacity. The individual suffers in many ways. Either he is out of work or overworked; his nerves and physical endurance are strained because conditions force him to certain activities at certain times; he must perforce travel to and from work in conditions of pressure such as even a sardine is not compelled to endure; he must take his holidays likewise. Freedom of choice and action are being steadily curtailed at the very time when physical abundance is potentially available. The world requires a more even distribution of all its activities, and that can be achieved only by increasing the freedom of the individual. Beware, then, of all restrictive proposals!

* * * *

The Week's Traffics

Except on the passenger side the traffics of the four group companies for the past week were disappointing and the only company now on the right side for the first six weeks of the year is the Great Western, with an increase of £25,000. For the year to date all the companies record increases in passenger train traffics, the L.M.S.R. gain being £46,000, that of the Great Western £29,000, and those of the L.N.E.R. and Southern being each £37,000. The four companies together have an increase in passenger train traffic of £149,000 or 2·57 per cent. Merchandise traffics of the four companies for the six weeks show a net decrease of £93,000, the only increase being that of £23,000 on the Great Western. Coal traffics for the six weeks are down in each instance, the total decrease being £92,000.

	6th Week				Year to date.	
	Pass., &c.	Goods, &c.	Coal, &c.	Total.	Inc. or dec.	
	£	£	£	£	£	%
L.M.S.R. ..	+ 5,000	− 6,000	− 4,000	− 5,000	− 8,000	− 0·13
L.N.E.R. ..	+ 5,000	− 17,000	− 8,000	− 20,000	− 46,000	− 0·96
G.W.R. ..	+ 2,000	− 2,000	− 8,000	− 8,000	+ 25,000	+ 0·96
S.R.	+ 4,000	− 8,000	− 5,000	− 9,000	− 7,000	− 0·36

London Transport receipts for the past week were £514,900, an increase of £1,700, bringing the total for the 32 weeks to £17,004,000, an advance of £328,900. Irish railway traffics for the week are generally down except for a passenger gain of £400 on the Great Northern.

* * * *

Regaining Twenty-six Minutes

Another example of what can be done in the matter of lost time recovery was given recently by the up Flying Scotsman of the L.N.E.R. Owing to a breakdown near Dunbar, the train left Newcastle 26 min. late, but notwithstanding this reached King's Cross dead to time. From Newcastle to London the engine was one of the latest Pacifics with 220 lb. pressure—No. 2503, *Firdaussi*, driven by R. J. Knight, of Gateshead—and the load 420 tons tare and 445 tons gross behind the tender. Six minutes were regained between Newcastle and York, 7½ min. thence to Grantham, ½-min. at Grantham station, and 12 min. from Grantham to London. This involved the making of three runs in succession at over 60 m.p.h. average from start to stop—Darlington to York, 44·1 miles in 44 min.;

York to Grantham, 82·7 miles in 82½ min.; and, most remarkable of all with this load, Grantham to King's Cross, 105·5 miles in 100 min. Thus the 232·3 miles from Darlington to London, including 5 min. standing at York, and 1½ min. at Grantham, were completed in an actual time of 233 min. If some means could be devised of suitably recognising, as is the regular practice in France, meritorious locomotive working of this description, such feats of time recovery would become habitual, rather than, as we commented on a similar L.M.S. achievement in a recent issue, the "occasional phenomenon." And both passengers and railway operation would stand equally to gain in consequence.

* * * *

Overseas Railway Traffics

Argentine exchange has been slightly better for the past fortnight and in the past week has averaged 16·94 pesos to the £, as against an average of 16·57 for the corresponding week in 1934. Yet railway receipts both in currency and sterling continue to fall except on the Buenos Ayres Great Southern and the Entre Rios, which have improved respectively in the two weeks by £22,215 and £4,286 in sterling and by 596,000 pesos and 85,900 pesos. Canadian Pacific traffics for the first four weeks of 1935 showed an aggregate decrease of £140,800, but in the past week this figure has been reduced by £5,400. Bombay & Baroda traffics have continued their advances during the past fortnight.

	No. of Week.	Weekly Traffics.	Increase or Decrease.	Aggregate Traffic.	Increase or Decrease.
		£	£	£	£
Buenos Ayres & Pacific ..	32nd	89,492	– 6,585	2,250,095	– 397,186
Buenos Ayres Great Southern ..	32nd	211,747	+ 2,996	4,278,083	– 847,181
Buenos Ayres Western	32nd	50,177	– 1,664	1,362,215	– 321,551
Central Argentine	32nd	130,452	– 14,660	3,753,922	– 640,758
Canadian Pacific	5th	436,400	+ 5,400	2,089,600	– 135,400
Bombay, Baroda & Central India	44th	201,150	+ 22,875	6,844,050	+ 339,600

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The Westinghouse Brake and Signal Company

It seems only recently, though actually it was in our issue of October 8, 1920, that we announced the formation of the Westinghouse Brake & Saxby Signal Company. That was followed, a week later, by an editorial note wherein we spoke of the union of two names which, more than any others, had made for safety in railway operation. None, we remarked, could rob Westinghouse of the credit for the air brake nor Saxby for the locking frame, facing point lock and the locking bar. Quite historic interest therefore attaches to the resolution unanimously passed at an extraordinary meeting, following the general meeting last week, that the name Saxby is to be dropped and the title of the company in future to be the shorter one of Westinghouse Brake & Signal Company. In 1856—nearly eighty years ago—John Saxby fixed his first locking frame and it was in 1860 that the firm of Saxby & Farmer was established. On the other hand, today one never hears the name Saxby in a personal sense unless the full name of the company is given; it is nearly always referred to, when abbreviated, as "The Westinghouse."

* * * *

Polish Railways Brake Contract

At the meeting referred to in the preceding note, the course of the negotiations with the Polish State Railways for the equipment of 39,000 wagons with the air brake and 73,000 wagons with the continuous piping and couplings, and their ratification on April 24, 1934, was related. Lord Southborough, the Chairman of the company, in closing his remarks, said that the firm was deeply indebted to Captain B. H. Peter, the Managing Director, for his able handling of the negotiations. He was of the greatest possible assistance, politically and technically, and the speaker ventured to believe that Captain Peter was also able to do much to promote the interests of the Polish State Railways. We are glad to be able to reproduce this splendid testimony to the good work done by Captain Peter, because we feel that it may have a still wider influence than in the spheres mentioned by Lord Southborough; he may have rendered more intimate the political relations of Great Britain with the ancient kingdom of Poland.

* * * *

Rapid Transit in New York City

The Brooklyn-Manhattan Transit Corporation is a holding company which controls an extensive system of rapid transit (subway) lines, trolley (tramway) lines, and bus routes in the three boroughs of Manhattan, Queens, and Brooklyn in New York City. Whereas the Interborough—the original rapid transit system—serves primarily Manhattan Island and the Bronx, the B.M.T. system is planned to connect the lower part of Manhattan Island with Brooklyn and Queens across the East River. Control is exercised by the B.M.T. through its holdings in the New York Rapid Transit Corporation, the Brooklyn & Queens Transit Corporation, and the Brooklyn Bus Company. Route miles controlled are 285 and passenger cars number 4,304 on the subways and tramways which are all on the standard gauge. In the B.M.T. system are also included 275 buses operating on 21 routes which cover 81 miles. The B.M.T. operating companies, like the company which operates the Interborough system, work under concessions granted by the City of New York and the rapid transit lines so conceded will eventually revert to the city. Competition is increasingly affecting both rapid transit and trolley lines from the New York Independent Subway system owned by the city and operated by its Board of Transportation. The first section of this subway—between Chambers Street, Manhattan, and 207th Street—was opened for traffic on September 10, 1932, and it has since been considerably extended in Bronx, Queens, and Brooklyn.

* * * *

Brooklyn-Manhattan Transit Corporation

Operating results secured by this company and its subsidiaries during the fiscal year ended June 30, 1934, were rather less favourable than in 1932-33 as will be seen from the accompanying table. There was a reduction in operating revenues due partly to the decrease in revenue from advertising and in part to loss of traffic on both rapid transit and trolley (tramway) lines caused by the competition of the Independent Subway system in Brooklyn. Two high speed, lightweight, multi-section cars—one constructed of aluminium alloy and the other of stainless steel—were built for the New York Rapid Transit Corporation during the year under review, and are now being operated for experimental purposes in local service on both subway and "L" lines.

	1933–34	1932–33
	$	$
Operating revenue	52,755,273	53,636,427
Operating expenses (including depreciation)	32,393,833	32,504,818
Net operating revenue	20,361,440	21,131,609
Taxes	4,180,048	4,185,270
Operating income	16,181,392	16,946,339

On the rapid transit lines the total number of passengers carried in the year 1933-34 was 606,437,805, a decrease of 6,560,502 or 1·1 per cent. as compared with the preceding fiscal year. Total passengers by rapid transit, trolley, and bus numbered 1,034,231,701, a decrease of

15,699,121, or 1·5 per cent. from 1932-33. New rails were laid during the year on approximately 14 miles of track on the rapid transit lines.

* * * *

Improvements in Portugal

The Portuguese Railway Company, which now works about two thirds of all the lines in Portugal, has been spending large sums of money in the last six or seven years on improvements to the track and stations of its southern and south eastern sections. In 1927, after the lines were taken over from the State, they were in such a bad condition that travelling on them could fairly be described as hazardous, but the position is now entirely changed. The chief improvements have been the laying of heavier rails, generally 18 m. (59 ft.) long, weighing 40 kg. per m. (80½ lb. per yd.), reballasting, resleepering and increasing the number of sleepers, and improving the alignments where possible. On some sections steel sleepers of old design have been replaced by wooden or concrete ones. New deviations have been put in and new stations built, while others have been provided with houses for the staff, sheds and awnings. Stations had been almost as much neglected as the track. The works follow similar improvements on the Minho and Douro section. Operations are still in hand and when complete should put the company in a position to deal with its traffic without the risk of tiresome delays and inconvenience to the public. The whole of the work has been done by the company's own engineering department.

* * * *

Increasing Productive Capacity

In the first of several articles on railway wheels and axles which we publish this week on page 288, mention is made of the tremendous increase of productive capacity since the war, due very largely to metallurgical developments. Not only has the quality of steel and other metals developed, but the introduction of cemented carbide tools has made practicable machining speeds that would have been thought impossible little more than a decade ago. Cemented carbides are, after the diamond, the hardest substances known, and are also tough. They consist of the powdered carbides of certain metals, of which that most commonly used is tungsten, cemented together with cobalt (or sometimes nickel) as the binder. Not only has the use of tools tipped with these substances increased machining speed by over 100 per cent., but the life of the tools between successive grindings has been multiplied by ten or twelve. To take full advantage of these new factors, it has been necessary to install new machines and arrange new layouts and works transport facilities. Although productive capacity has been raised as much as 500 per cent. in some instances by these means, finality is far from having been reached. What a pity it is our financial arrangements do not progress correspondingly, so that we might profit by this great increase in real wealth.

* * * *

A "Whitewash Van"

In the customary method of recording track oscillations, the measuring instrument employed—the Hallade recorder—is carried in a variety of coaches, so that oscillations caused by differences in suspension prevent an absolutely true comparison being made between record and record. This difficulty has been overcome on the Great Western Railway, as recorded on page 287 of this issue, by setting aside a bogie coach specifically for track-recording purposes, which is kept in a specially good running condition, including the profiles of the tyres. Additionally to carrying the Hallade instrument, however, the car has been fitted with apparatus of an ingenious kind which, when the movement of one of the bogie frames relatively to the coach-body exceeds a certain predetermined amount, opens a valve in a pipe leading from a storage tank, and so automatically causes a splash of whitewash to drop on to the track closely adjacent to the point where undue oscillation has been experienced. The Hallade machine has been fitted with an additional pen, so that the roll of paper may be marked wherever a splash of whitewash has thus been made. Another item of equipment in the car is a speedometer. The "whitewash van," as it is known officially, works to a scheduled programme, over all the principal lines of the G.W.R., attached to the rear of express trains, and the series of records so obtained gives, in effect, a maintenance history of each route, on a truly comparable basis.

* * * *

Quadrupling the P.L.M.

Over its main line between Paris and Dijon—a distance of all but 200 miles—the P.L.M. Railway carries, especially during the night hours, one of the densest long-distance train services in the world. Between 7.30 and 10.5 p.m., for example, no fewer than 13 express trains leave the Gare de Lyon for the Riviera, Italy, Switzerland, Eastern and Central France, all of which make only one intermediate stop, at Laroche—to change engines—midway on the run of 195·2 miles to Dijon. A similar service is operated in the reverse direction. It is the ultimate aim of the P.L.M. administration to provide quadruple trackage throughout between Paris and Dijon, and this purpose is being steadily pursued. For some time past there have been four tracks over the 27·4 miles from Paris to Melun, and two alternative routes from thence to Montereau and Villeneuve-la-Guyard, 55·4 miles out, one via Fontainebleau and the other via Héricy, and both roughly equal in grading and distance. Another stretch of quadruple track, 37·1 miles in length, has been in use for a number of years from Sens through Laroche to St. Florentin. Work is now well in hand in closing up the 14·5-mile gap in the four tracks. between Villeneuve-la-Guyard and Sens. On its completion, four roads will be available throughout over the 107 miles from Paris to St. Florentin, leaving 88·2 miles from there to Dijon to be tackled in later stages of the widening work.

* * * *

The Locomotive Markets in the U.S.A.

Our American contemporary, the *Railway Age*, in reviewing the number of locomotives ordered during 1934 in its Annual Statistical Number, stated that last year was the best from the point of view of the locomotive markets since 1930. The number of engines ordered was 183, this being more than three times the combined figures of 1932 and 1933, and seven locomotives in excess of the 1931 total. Whilst, however, the improved situation reflected in this comparison is distinctly encouraging, our contemporary points out that it leaves the American locomotive builders in a position far short of the business they handled in the years prior to the depression. The 1934 total was less than half that of 1930, which in its turn was but little more than one-third of the 1929 orders. Last year's orders covered steam, electric, diesel and petrol locomotives, the straight electric type slightly predominating in numbers. The distinction between locomotives ordered and the number built is emphasised. A locomotive is under construction for several months, and thus the production figures for any year naturally include some units which were ordered during the closing months of the preceding year.

Railways and Rating Assessments

THE judgment given by the Railway and Canal Commission on February 6 in connection with the appeals made by the Southern Railway Company and certain local authorities against the proposed assessment made by the Railway Assessment Authority under the Railways (Valuation for Rating) Act, 1930, is of very great importance to the railway companies generally and the Southern Railway in particular. It will be recalled that the net annual value of the Southern Railway hereditaments to be assessed for rating purposes was fixed by the Railway Assessment Authority for the year 1931 at £2,180,000 as compared with the existing figure of about £1,840,000. The Southern Railway contended, however, that the new assessment should not exceed £500,000, while the London County Council, the Corporations of Brighton and Croydon, and the County Valuation Committee of Middlesex contended that the correct figure was £3,000,000. In its judgment the commission found that the correct net annual value for the year in question was £1,077,131, which is £761,720 less than the figure now operative under the existing arrangements. In this connection it should be borne in mind that under the provisions of the 1930 Act this new figure has to be adopted retrospectively to April 1, 1931. Assuming, therefore, that the decision of the commission is not disturbed by the House of Lords, should the Railway Assessment Authority decide to lodge an appeal, and that the average rates paid by the Southern Railway are 10s. in the £, the company would be entitled to a refund of about £375,000 per annum, or a total of about £1,500,000 in respect of the four years ending March 31, 1935, while the payment for the ensuing year of the quinquennial period will be reduced accordingly.

In the course of its judgment the commission made it quite clear that the figures and percentages which it applied to the Southern Railway were based upon the facts of the case and could not be applied automatically to any other railway, as each case must be decided strictly upon its own merits. Assuming, however, that a somewhat similar reduction were made in the proposed assessment of the other three main line companies, their annual saving in rating payments for the five years ending March 31, 1936, would approximate £1,000,000 in the case of the L.M.S.R., £750,000 for the L.N.E.R., and about £500,000 for the G.W.R., making a total annual saving, with the Southern Railway, of £2,625,000. Having regard to the large sums involved, it is necessary to recall that under the provisions of the Local Government Act, 1929, the railway companies were relieved from the payment of three-fourths of the local rates on freight transport hereditaments upon condition that similar sums were contributed to a Railway Freight Rebates Fund, through which they are utilised to assist trade and industry by means of rebates from the railway rates on certain important traffics enumerated in the Eleventh Schedule to the Act. It follows, therefore, that of any sums to which the railway companies may become entitled in respect of overpayments of rates since April 1, 1931, only 25 per cent. will be recoverable from the local authorities and the balance of 75 per cent. from the Railway Freight Rebates Fund.

As the railway assessments probably do not represent more than 5 per cent. of the total assessments of local authorities, speaking broadly, little difficulty should arise in securing any refunds which may be payable, although possibly to meet local circumstances, these may be arranged over a period. So far as the Freight Rebates Fund is concerned, the railway companies have repeatedly drawn the attention of the Railway Rates Tribunal, which is charged with the duty of reviewing the fund annually, to the possibility of substantial refunds being necessary when the valuations are finally completed. For this reason the tribunal, after reviewing the operation of the scheme in November, 1934, decided to retain a sum of £500,000 for the purpose of such an eventuality. As contributions of the railway companies to the fund last year totalled £3,900,000, it is clear that if their overpayments in respect of rates since 1931 should prove to be anything approaching £7,500,000, the tribunal will have to consider cancelling the rebates entirely for a substantial period or, alternatively, drastically reducing them for a longer period. The future developments in connection with the recent judgment affecting the Southern Railway and the assessments of the remaining three main line companies will therefore be followed with the keenest interest by railway companies, their shareholders, and traders.

* * * *

Noise Suppression on Tube Trains

OF all the many complaints we hear levelled against the machine and against such progress as the machine represents, none is heard more often than that regarding noise. On the road, in the office, in the factory, and even in the home the sound of machinery in one form or another is ceaseless and sometimes it is scarcely bearable. Travellers on railways have been known to complain of the noise consequent upon the motion of trains, but for many years now main line travel in this country and in many countries abroad has been remarkable for the entire absence at all speeds of anything resembling clatter or fuss. Sleepers, eaters, and conversationalists can make themselves heard as well as seen on the modern train, so much so that it might be an advantage sometimes if the train itself became less silent. This it does on entering a tunnel, for sound normally transmitted over the countryside as a wave motion in the air is reflected when it strikes tunnel walls and, being turned back, it penetrates windows and other openings to the interior of the carriage. In this way the general level of noise in a train is much increased by tunnels and on railways which run underground the effect is, of course, continuous. On tube railways, where the space is confined to the absolute minimum, the noise sometimes approaches the intensity which must be endured in an aeroplane, and there is no doubt that here it passes the limit set by modern standards of comfort, low though the standard is when account is taken of the high frequency electric motor horn, the pneumatic road chipper and the radio-gramophone.

The London Passenger Transport Board, which is responsible for the world's largest tube railway system, is giving the problem of noise a good deal of consideration and, following the lead set by the organisations it superseded it is conducting several experiments with the object of mitigating the noise in tube trains. The usual expedient of shutting all the windows and ventilators, while practicable and very effective on a main line railway, where the train is seldom underground for more than a minute, is hardly to be considered on a tube railway owing to the need for admitting fresh air on a journey underground lasting half an hour or more. Nevertheless, it is the aim of the latest experiment of the L.P.T.B. to make practicable the closing of all openings in a tube car while it is passing through a tunnel. A standard car has now been so modified that the direct ingress of aerial vibrations and indeed of air itself is impossible except when the automatically operated doors are opened at stations. The windows are fixed instead of being made to open and ordinary apertures for ventilation are no longer provided. The car starts the day with its interior full of naturally constituted air, and thereafter the escape of

vitiated air and the ingress of fresh air takes place at stations when the doors are open. To overcome the liability of the air in the car to become hot and humid between stations—a contingency very likely to arise during the rush hour—an air circulating, cooling and de-humidifying plant is provided; air from inside the car is drawn in under seats near the centre of the car, where cooling coils are situated; here, owing to the fall in its temperature, it deposits a large proportion of its moisture. The fans for drawing the air out of the car are situated underneath the car body on the two ends of the armature shaft of a small motor. On leaving the fans the cool and moisture-free air passes up to the top of the car to be reintroduced through the roof. A deflector plate covers the roof openings and prevents the incoming air from impinging directly on passengers and causing the sensation of draught. Between the fans and the roof openings the air traverses passages up the sides of the car, these being formed by making the body double-walled where necessary. Insulation against noise is ensured by spraying the inside of the car panels with asbestos and, for the same reason, all side windows are double glazed, two of them forming a duct to the roof for the conditioned air.

The cooling coils under the seats are maintained at a low temperature by means of a vapour-compression refrigerating machine mounted under the car and driven through V belts by a small electric motor also under the car. A condenser is slung nearby to dispose of the heat extracted from the car, with additional heat necessarily produced by the working of the refrigerating machine. The condenser is in the form of a nest of tubes, round which air is drawn by a fan driven by another small motor. The working fluid of the refrigerating machine is an odourless non-poisonous substance known as Freon, which, unlike ammonia (one of the fluids commonly used in refrigeration), might leak slightly without giving offence to passengers. As regards the main objective of the experimental car, namely, noise suppression, the result of the trials may be taken as known, for the closing of openings in standard cars effects an improvement which has already been noted. The features of the car which require testing are those introduced to condition the air. It is necessary to emphasise that an equipment of this kind can be regarded only as experimental. Considerable experiment with a view to simplification and reduction in first cost would be necessary before extending its use.

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Home Railway Dividends

THE first of the four group railways to declare its final dividend for the year 1934 was the Southern, which announced on Monday a distribution of 4 per cent. on the 5 per cent. preferred ordinary stock, comparing with 3 per cent. for 1933. This was up to the best expectations, as the more general estimate was 3½ per cent. It has been fully earned, with an increase of £2,426 in the carry forward. The extra 1 per cent. will require £275,866 more, so that net revenue for the year has presumably increased by £278,292. No interim distribution was made last August, when according to the official statement the net revenue for the first half of the year was given at about £90,000 higher than for the first six months of 1933, and there was little or no change in the net receipts from ancilliary businesses. As the estimated gross traffic receipts during the second half of the year showed an increase of only £168,000, savings, ancillary businesses, and miscellaneous receipts may all have contributed to the improvement in net revenue.

A gratifying feature of the London Midland & Scottish announcement on Wednesday is the return to the dividend list of the £40,133,987 of 4 per cent. preference stock (1923), which received nothing in 1932 and 1933 and is now to get 1⅝ per cent. This will require £652,177. The 4 per cent. senior preference stock and the 5 per cent. redeemable preference stock (1955), which ranks with it, obtain, of course, their full quotas for the year 1934, as against the 3½ per cent. and 4⅜ per cent. respectively received for the year 1933, and the additional distributions on these stocks represent £655,163. Net revenue for the year is about £1,209,000 higher at £11,921,000, and judging from the interim statement made last August £1,000,000 of this improvement came in the first half of the year. The carry forward is reduced from £59,654 to £20,519.

As was generally expected, the directors of the Great Western Railway in their statement issued on Wednesday recommend a final dividend of 2¾ per cent. on the consolidated ordinary stock, making 3 per cent. for the whole year 1934, the same as for the two preceding years. Net revenue is £5,410,999, an increase of £582,438 over 1933, and as net revenue for the first half of the year was stated last August to be £370,000 higher than that for the first half of 1933, the improvement for the second half of the year is in the neighbourhood of £212,000. Following their previous policy the directors have again utilised free reserves for maintaining the 3 per cent. dividend, but the contingency fund has been reduced only by £39,581.

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Railways and Bad Roads

IT has frequently been alleged that the railway companies exert every possible effort to restrict the development of road transport, but a somewhat novel criticism is made in a recent issue of a road transport journal, *Highways and Bridges*, where it is contended that the railway companies are entirely responsible for the existence of bad roads to-day! Bad roads are defined by the writer as those which are unsuitable to carry the traffic which normally comes upon them and the basis of his argument is that the unsuitability of roads to carry the present traffic is being used by the railway companies as a lever for securing restrictive and penal legislation with the view of so handicapping road transport that its effectiveness in competition with railway transport may be destroyed. In dealing with this argument, it is necessary to bear in mind that the present road difficulties are a phenomenon of this century and of the present generation. Before the advent of the internal combustion engine the road system of this country was used almost entirely by horse-drawn traffic. At the beginning of this century the cost of constructing and maintaining the roads amounted to about £12 millions annually. This cost fell upon the public revenues and almost entirely upon that portion of them which was raised locally in the form of rates. Within a single generation this situation has been transformed completely, as motor vehicles, of which there are about two million in the country, have become the predominant users of the road. To facilitate the passage of this new class of traffic, with its far greater weight and higher speed, about £60 millions annually has been expended on the roads in recent years. While part of this substantial increase in expenditure arises from the change in costs and prices since 1900, it is clear that much larger sums have been spent on the improvement of foundations and surface, widenings and straightenings, stronger bridges and the construction of by-pass and arterial roads, with the result that a veritable transformation has been effected in the country's road system.

Although much more doubtless remains to be accomplished, it is the fact that the railway companies have

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had no voice whatever in the acceleration or retardation of road improvement programmes as, for the last 15 years at least, Parliament has controlled the whole situation through the medium of the Road Fund. The revenue of this fund is derived from a proportion of the excise duties chargeable on mechanically propelled vehicles and the money is utilised at the discretion of the Minister of Transport for the purpose of giving grants totalling about £20 millions annually to highway authorities for the purpose of improving the roads, the balance of the expenditure being provided by the highway authorities. After such a substantial expenditure over a series of years it is not surprising that the Royal Commission on Transport should remark that it would probably not be exaggerating to say that our roads are the best in the world. Incidentally the Minister of Transport recently announced a five year plan for the purpose of removing blind corners, circumventing the dangers of cross-roads, and so forth, in order that highway authorities may be encouraged to think and plan ahead. Enough has been said, however, to show that the railways cannot in any circumstances be held responsible for the fact that the whole of our extensive road system has not yet been completely modernised. It is somewhat amusing to read in the same journal, moreover, that at a recent function the Somerset County Council Surveyor contended that British roads were far behind those on the Continent, while the Devonshire County Council Surveyor claimed it was well known that the British road system was the best in the world!

As illustrative of the penal legislation said to have been inspired by the railway companies, the article in question condemns the appointment of traffic commissioners on the ground that their purpose is so to persecute and disorganise road transport generally that traffic will be driven to the railways. In support of this statement, it is urged that the powers the commissioners hold are not in the public interest, because it is within their authority to eliminate competition, increase passenger fares where considered desirable, limit the radius of goods carrying vehicles and prevent operators from increasing the number of their vehicles. All these restrictions, it is claimed, were instigated by the railways. The writer overlooks, of course, that the traffic commissioners were appointed by Parliament as the result of the recommendation of the Royal Commission on Transport in 1931. This body—on which the railways were not represented—was set up for the purpose of considering the problems arising out of the growth of road traffic and reporting what measures should be adopted for the better regulation and control of transport and for promoting co-ordinated working and development in the public interest.

The annual reports of the commissioners provide ample justification for their appointment, and a study of those for the twelve months ended March 31, 1934, shows clearly the growing tendency of operators voluntarily to enter into agreements and joint working arrangements by means of which they are able to remove anomalies in fares, adjust timetables, eliminate waste mileage and achieve a steady progress towards co-ordination, which is as much in the public interest as it is of the operators themselves. The assertion that the elimination of competition between road hauliers is against the public interest scarcely needs contradiction; we would merely remark that the Road Haulage Association, when submitting its views on the desirability of regulating road transport hauliers to the Salter Conference in 1932, laid stress upon the "evils of overcrowding and unbridled competition in the road transport industry." Finally, the argument that the appointment of traffic commissioners is penalising and stultifying the growth of the road haulage business is completely controverted by the latest Ministry of Transport statistics, which show that the total number of goods vehicles for which Road Fund licences were current at any time during the quarter ended September 30, 1934, was 413,320, an increase of nearly 26,000 compared with the corresponding period of the previous year.

* * * *

Long Welded Rails in America

IN August, 1933, the Delaware & Hudson Railroad of the U.S.A. successfully welded the rail joints over a distance of more than 3,000 ft. in both up and down lines at Albany, N.Y. Owing to the presence of turnouts the longest continuous stretch of welded construction was 2,700 ft., in the north bound track, including 68 successive welds on standard 39-ft. rails of 130 lb. R.E. section. Several curves, including two as sharp as 4 degrees (1,432 ft.) were included in these welded lengths, as well as a gradient of 1 in 100. A second installation of welded track was made in May, 1934, at Mechanicville, N.Y., where both rails in both main tracks were made continuous for a distance of approximately 2,000 ft. involving a total of 254 welded joints. The tracks at this point are straight and on a grade averaging 1 in 400. A photograph of a section of this track, which is laid with 131-lb. A.R.E.A. section rail, is reproduced on page 290, from which the great depth of ballast used will be noticed. This is the standard construction of the Delaware & Hudson and includes from 14 to 18 inches of crushed stone ballast beneath the sleepers, which are of treated red oak carrying large double-shoulder, canted and cambered soleplates, fastened independently of the rail. The latter is held to each plate by two spring clips.

Thermit pressure welds were used to join the rails together, and the cost per joint at Mechanicville, which profited from the experience gained in the earlier installation at Albany, was approximately $8 (£1 12s. 9d.). No trouble whatever has been experienced with the alignment or level of the track, despite wide variations in temperature since welding was completed. At Albany the atmospheric temperature at which the work was carried out was well above 125°, the effect of which would be, of course, that at temperatures lower than this the rails would be in tension. Even on the rare occasions when temperatures were higher, and the rails took on the functions of struts, any tendency to buckle would be easily resisted by the excellence of the ballast and the track maintenance generally.

The Delaware & Hudson installations may be said to have been completely successful up to the present. At Mechanicville no failures of the welds have taken place, and at Albany, out of a total of 311 welds, only 5 failed, due to causes which were easily ascertained and avoided in the later work. It is proposed to instal additional sections of welded track as a result of these experiments, and important savings are anticipated. According to our American contemporary, *Railway Engineering and Maintenance*, the Delaware & Hudson authorities summarise the advantages of welding as saving in track maintenance, increased life of rails through elimination of end batter, reduced mechanical wear of joint sleepers with resultant increased life and the avoidance of specially large joint sleepers, more efficient track circuits, smoother and quieter running and consequent reduced maintenance of rolling stock. In assessing the advantages of welding joints it is, of course, necessary to take into consideration the traffic conditions. In both the experimental installations above described complete possession of the track on which work was being done was obtained, this being necessary primarily because of the character of the equipment used and the time required in the pre-heating operation.

LETTERS TO THE EDITOR

(*The Editor is not responsible for the opinions of correspondents*)

An Appreciation

Hooge Nieuwstraat 30,
The Hague, February 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I would like to add my congratulations to the many you must have received on the amalgamation of *The Railway Engineer* and THE RAILWAY GAZETTE. The result is a journal which, from the view-points of convenience to the reader and of the comprehensive way in which its subject-matter is treated, must be unrivalled in any sphere of mechanical activity.

I am very glad to see, by the way, that "The Scrap Heap" has been retained. In that section of your February 1 issue I was most interested to note the reproduction and paragraph dealing with the recently revealed Midland Railway poster at St. Pancras. This was drawn to my attention just before I left England, and several of my photographic friends expressed excitement thereat, but they have apparently been forestalled.

I am, Sir,
Yours faithfully,
GEORGE R. GRIGS

PUBLICATIONS RECEIVED

Railway Wonders of the World. Edited by Clarence Winchester. Consulting Editor, Cecil J. Allen, M.Inst.T. London: The Amalgamated Press Limited, The Fleetway House, Farringdon Street, E.C.4. With folding coloured plate, photogravure supplement, and numerous illustrations from photographs. 11 in. × 8½ in., 36 pp. In about 40 weekly parts, price 7d. each.—This latest addition to popular railway literature is described by its editor as "the most important railway work yet published." To judge by the first number would not be fair—so we will say no more than that it resembles the Lexicon written by Liddell and Scott, for part is good, and part is not. The folding coloured supplement, which consists of a semi-sectional drawing of a Great Western "King" class locomotive, is well produced and well executed, though not absolutely accurate and not quite complete. The photogravure supplement is also good. From the point of view of the type of reader for whom the book is intended, it perhaps contains too high a percentage of matter relating to foreign railways. The text deals comprehensively with the various subjects, but though the world has been combed for appropriate illustrations (see the Editor's Foreword again), some of the half-tone blocks present very old familiar faces.

German State Railway Almanac for 1935. Edited by the Pressedienst der Deutschen Reichsbahn, Berlin, W.8, Voss-strasse 35. Leipzig: Konkordia Verlag. 160 sheets with coloured pictorial cover. 10¼ in. × 6¼ in. Fully illustrated. Price 3·20 RM.—This is the ninth of the beautifully produced official almanacs produced by the German State Railway Company, and this time it commemorates the Centenary of the German railways. As might be expected, in view of this, some remarkable illustrations from old prints, drawings and photographs occur in the course of the Almanac's 160 sheets, together with a large amount of valuable general information regarding the earlier history of Germany's railway system. The fact that railways were well established long before the formation of the German Empire makes some of the contents doubly interesting. At the same time, the recent notable developments in the design of rolling stock and other equipment have not been ignored. On the contrary, they have been made a powerful foil where the historical matter is concerned. Our old friend the Flying Hamburger is here again, this time portrayed on the Berlin-Cologne run, which she made in the remarkable time of 4 hr. 45 min. without a stop. The train is shown outside the Cologne Hauptbahnhof, with the huge Gothic cathedral towering above. A fine example of modern German railway architecture is shown in the picture of the new station at Oberhausen, which might be described as being "like Stuttgart, only more so." Another interesting feature is a chart, which shows the direct dependence of the rail and road transport industries, through the Government and the Chancellory, on the Leader, Adolf Hitler. Returning to the "reminiscent" illustrations, it is amusing to observe that one print, published in 1842, shows what are described as "trains of wagons on the about-to-be-opened railway between Hanover and Brunswick." As the railway had not yet been opened, the artist of that print could not portray its trains, so he "lifted" them from Ackermann's long prints of the Liverpool & Manchester Railway, turned them the other way round, and gave the locomotives German names. The coaches, for some reason, retained such names as *Wellington*, *Victoria*, and *Adelaide*. The last two, it should be noticed, did not become *Viktoria* and *Adelheid*! The final leaf in the Almanac deserves a special note. It shows a large German express locomotive standing in a lighted station at night. An illuminated clock over the platform indicates five minutes to twelve, and the underline runs: "Departure into the New Year." On the outside cover is a coloured picture of the opening of the Ludwigsbahn in 1835, with a phantom 1935 locomotive looming mistily in the evening sky above. *Sehr schöner Wandschmuck*!

G.E.C. Electrical Illuminations.—We have received from the General Electric Co. Ltd., Magnet House, Kingsway, W.C.2, a catalogue of illumination devices, floodlights, neon signs and accessories, suitable for display during the Royal Jubilee celebrations this year. The devices are of reinforced papier mâché and metal construction, and are supplied ready wired with lampholders. The range of designs includes flags, shields, crowns and wreath motifs, all handsomely coloured and highly resistant to weather. Floodlighting equipment for plain or colour effects forms another section of the catalogue, which includes a number of striking illustrations of actual schemes which have been carried out for the illumination of large buildings. Other pages show neon signs, lamps and other components necessary for the building up of displays. The numerous coloured illustrations in the catalogue will, in themselves, be found a source of inspiration to those concerned with the arrangement of displays.

Fans and Blowers.—An illustrated folder arrestingly entitled "Air Costs Nothing!" has been published by James Keith & Blackman Co. Ltd. to show typical industrial applications of the firm's ventilating and air-conditioning plant. In conjunction with gilled tube air heaters, K-B fans can be used for the supply of suitably warmed air in factories and offices, while its passage through air-washers ensures a purity of atmosphere which promotes the health and efficiency of workers. The fans can also be used for drawing off the dust, shavings and fumes inseparable from many workshop operations. Drying, pneumatic propulsion of materials in factories, and the supply of high pressure air-blast to furnaces are other purposes for which the movement of air by fans or blowers is necessary, and all are catered for in the K-B range of apparatus. Another folder received from the same source illustrates examples of high efficiency blowers and exhausters for supplying gas to blast furnaces and air to furnaces using gas or oil fuel.

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THE SCRAP HEAP

WHAT GERMAN TRAVELLERS EAT

Figures published in the *8-Uhr Blatt* of Berlin show that travellers in German restaurant cars eat 4,000 eggs a day, or 120,000 in a month. Other quantities of food supplied monthly to trains from the Berlin central kitchen are: game, 6,000 lb.; butter, 13,200 lb.; fish, 6,600 lb.; and meat, 55,000 lb. Sandwiches come lowest in the list with a total number of 5,000, being handsomely beaten by 320,000 biscuits.

* * *

THE FLYING SCOTSMAN—AN INQUIRY

To the Editor of the North-China Daily News

Shanghai, February 16, 1934.

I wonder if any of your readers could give me the correct record speed the "Flying Scotch" ever made? Answers in regard to the above will be greatly appreciated.—J.S.

[On September 19 last the Flying Scotsman accomplished the 94 miles from Coventry to Euston in 75 minutes, at an average speed of 74·8 m.p.h. A maximum speed of 92 miles an hour was attained on the journey.—ED. *North-China Daily News.*]

The member of our contemporary's editorial staff should take more water with his Flying Scotch next time!—ED R.G.

* * *

LOGIC

"If you had been dressed sooner, dear, we shouldn't have missed that train."

"If you hadn't made me run all the way to the station, darling, we shouldn't have had to wait so long for the next!"—*From "The Evening News."*

* * *

FINALE

Two poets (?) have seen fit to wage
A friendly battle on this page.
One advocates avoirdupois,
The other would such things debar.

In summing up the case, it seems
That reams, and reams, and reams.
and reams
Might yet be written on this score—
But as we do not wish for more

We'll bid the combatants refrain
From further comment on the train,
Whose shape, since its inauguration
Endeared it to the British nation.

—ED. R.G.

* * *

It is a peculiarity of this district that, between the semi-circular enclosure of Park Crescent and the quadrangular space within Park Square, a tunnel under the new road has been for a long time in existence as a means of uniting the two enclosures. This was familiarly known as the "Nursery-maids' walk," and was the means by which the children of the residents in Park Crescent could avail themselves of the extra accommodation afforded them by the enclosure of Park Square. Such was the resistance of the inhabitants of this part to the progress of the Metropolitan Railway, that ascending and descending gradients, to the extent of 1 in 100, had to be introduced so as to carry the line under the subterranean thoroughfare, for the benefit of the nursery-maids and children of this highly genteel neighbourhood.—*From a contemporary account of the building of the Metropolitan Railway in* 1862.

* * *

A correspondent tells us that some time ago the Netherlands railway authorities were extremely worried by the introduction of convenient, comparatively fast, and certainly cheap services run by road motor coaches between The Hague and Amsterdam. The return fares charged for the road journey were, in fact, less expensive than a second class single ticket by rail, and a specially appointed commission devoted considerable attention to the matter. In due course a certain official was asked to make an exhaustive examination of all aspects of the case, and his report was laid before the commission. After that, various attempts were made to enter into a working agreement with the road company which, however, did not seem at all eager to lose its independence. This state of affairs continued for some time until eventually another official was appointed to inquire into the possibilities of buying the concern outright. These, evidently, made a considerable impression on him since, when he was next heard of, he had resigned his railway appointment, invested in a fleet of coaches, and was busy operating a very profitable road transport system of his own.

MIDLAND RAILWAY

(OF ENGLAND).

THE PICTURESQUE ROUTE BETWEEN LONDON AND LIVERPOOL.

THE MOST INTERESTING ROUTE TO SCOTLAND.

EXPRESS TRAIN SERVICES

FROM AND TO

LONDON (St. Pancras)

WITH

MANCHESTER & LIVERPOOL

(Central and Victoria) (Central),

IN CONNECTION WITH **STEAMERS** FROM AND TO **AMERICA,**

Through the PEAK OF DERBYSHIRE and VALE OF MATLOCK.

SCOTLAND & NORTH OF IRELAND

Via CARLISLE and THE VALLEY OF THE EDEN.

ALSO WITH PRINCIPAL TOWNS IN THE

MIDLAND COUNTIES and NORTH OF ENGLAND.

THE DIRECT ROUTE TO

GLASGOW, GREENOCK, &c., through the LAND OF BURNS, EDINBURGH, via MELROSE, and the WAVERLEY DISTRICT, PERTH, DUNDEE, ABERDEEN, &c., over the FORTH BRIDGE.

BREAK OF JOURNEY for CHATSWORTH, HADDON, AYR, MELROSE, and other Tourist resorts. The Midland Expresses pass through the most interesting parts of England and Scotland. The Manchester and Liverpool Trains traverse the unequalled scenery of the PEAK DISTRICT and the VALLEY of the DERWENT. Holders of Through Tickets between LONDON and LIVERPOOL by the Midland route may break their journey at Matlock; or at Bakewell or Rowsley, for Haddon Hall and Chatsworth. Tickets available for ten days.

Passengers to Scotland may break their journey at any Station in Scotland on the Line covered by the Ticket held between Carlisle and their destination, thus affording ample facilities for visiting places of interest en route. **Tickets to Stations North of the Forth, and vice versa, are available via Glasgow and Edinburgh.**

SALOON CARS.—**Drawing Room Saloon Cars** by Day Express Trains, open to holders of First Class Tickets **without extra charge.** Refreshments served at First Class Refreshment Room. Tariff, on application to the Conductor.

Sleeping Saloon Cars, with comfortable beds, by some of the Night Express Trains. Charge per Berth, **5/-** in addition to the Ordinary First Class Fare.

Dining and Luncheon Saloon Cars by some of the principal Trains. Hot or Cold Luncheon, **2/6.** Table d'Hôte Dinner, **3/6,** served en route.

Comfortable Saloon Carriages, with Lavatory and other conveniences, specially adapted to the use of family and pleasure parties, will be reserved, without extra charge, for seven or more First Class, or fourteen Third Class passengers, on application, by any Train.

CARRIAGES WITH LAVATORY ACCOMMODATION for both First and Third Class Passengers by the Midland Express Trains.

PRIVATE and FAMILY OMNIBUSES provided in London, Manchester and Liverpool.

HOTELS.—The MIDLAND GRAND HOTEL, LONDON (ST. PANCRAS).

The ADELPHI HOTEL, LIVERPOOL (Adelphi Hotel Co.), recently refurnished and redecorated throughout.

BAGGAGE ARRANGEMENTS.—Baggage is checked through between New York and London, and London and Liverpool and delivered to the Tender, or Steamer, if it leaves direct from Dock.

TICKETS, TIME TABLES, and every information respecting the arrangements of the Midland Railway Company, may be obtained at the Company's Agencies, or of their representative in attendance at the landing stage, Liverpool, or New York.

NEW YORK AGENCY.—Mr. W. HURLEY is Agent to the Midland Railway Company for Passengers and Merchandise Traffic in America. His office is 261 and 262 Broadway, New York.

QUEENSTOWN AGENCY.—Mr JAMES RYAN the Company's representative at Queenstown, visits all the Atlantic Steamers calling at that port on their way from New York to Liverpool.

LIVERPOOL AGENCY.—The Company's Agent in Liverpool is Mr. J. B. CURTIS, 21 Castle Street.

THROUGH TICKETS, both for the ocean passage, by all lines of steamers, and the railway journey from Liverpool or Glasgow to London, Paris, Switzerland, Italy, and all parts of the Continent of Europe, Egypt and Palestine, with Time Tables and every information respecting the Midland Railway and its arrangements, may be obtained at the Offices of the Company's Passenger Agents, Messrs Thos. Cook & Sons, 261 and 262 Broadway, New York, 1 Place de l'Opera and Grand Hotel, Paris, and other towns on the Continent.

Derby, 1894. **GEO. H. TURNER, General Manager.**

FORTY YEARS AGO: one of the former Midland Railway advertisements reproduced from an American travellers' guide

OVERSEAS RAILWAY AFFAIRS

From our correspondents

ARGENTINA

Plans for Grain Elevator System Approved

The Grain Elevators Committee, under the Chairmanship of the Minister of Agriculture, has now provisionally approved of the plans and specifications for the erection of 14 terminal grain elevators with a joint capacity of 650,000 tons. This is part of the scheme for constructing a chain of national elevators at an estimated cost of $100,000,000 paper referred to in THE RAILWAY GAZETTE of December 12, 1933. It is stated that tenders for the work will shortly be called for, and the points at which it is proposed to erect these terminal elevators and the capacity of each elevator are as follow:—

Buenos Aires (150,000 tons); San Nicolás, Villa Constitución and Santa Fé (50,000 tons each); Rosario, 100,000 tons in two units (north zone and south zone); Bahia Blanca (extension of Ingeniero White elevator, 60,000 tons); Bahia Blanca (commercial port, 30,000 tons); Quequen (50,000 tons); La Plata (30,000 tons); Mar del Plata, Concepción del Uruguay and Diamante (20,000 tons each); Riachuelo (B.A. Provincial Railway, 20,000 tons, transfer elevator).

The capacity for handling and cleaning has been reckoned in accordance with the requirements and transport equipment of each zone, as calculated on the basis of crop and transportation statistics over a period of years. The scheme also provides for the building of 450 subsidiary elevators, with a joint capacity of 650,000 tons.

German Diesel Ferries

A decree issued by the Argentine Government authorises the Ministry of Public Works to accept the tender of the Deutsche Werft A.G., Hamburg, for the construction of three ferry boats for carrying passengers and vehicles between the river ports of Victoria (Entre Rios) and Rosario de Santa Fé, and Puertó Constanza and Zárate; the cost (including spare parts), is 1,241,120 RM., equivalent at the official exchange rate to $1,444,539 Argentine paper. Each of the vessels, which have been specially designed for navigation in narrow and shallow waters, will be about 120 ft. long with a draught of 4 ft. 4 in. and will be equipped with two 300 h.p. diesel motors capable of developing a speed of about 12 m.p.h., with accommodation for 80 first and second class passengers and 10 motorcars or lorries. By the terms of the contract, the vessels have to be delivered within eight, nine and ten months, respectively, after the acceptance of the tender. It is stated that several British shipbuilding firms which were interested in securing the contract, found it impossible to comply with the specifications in regard to dead-weight and other conditions laid down by the Ministry of Public Works, and had to withdraw their tenders.

Argentine Harvest Statistics: 1934/35: First Official Estimate

The first official estimate of the 1934-35 Argentine harvest, issued by the Ministry of Agriculture, calculates the probable production in tons of the four principal crops as follows: wheat 6,860,000, linseed 1,830,000, oats 1,130,000, and barley 930,000. The figures for wheat show a reduction of 927,000 tons, or 12 per cent., as compared with the preceding year, while linseed shows an increase of 390,000 tons (27 per cent.) over the 1933-34 period. The estimated oats crop is the heaviest since 1925-26, while the figures relating to barley are said to be the highest on record.

Railway Pension (Amendment) Law

A petition, signed by 890 British-born employees on the Argentine railways, has been presented to the British Ambassador, the Rt. Hon. Sir Henry Chilton, G.C.M.G., asking His Excellency to point out to the British Government the difficult position in which the petitioners would be placed if the clause in the amended Railway Pension Bill became law, as this virtually threatens to deprive foreign-born employees of their pensions if they decide to live outside Argentina after their retirement. The document set forth the manifest injustice and even injury which the clause in question would inflict upon hundreds of British-born railwaymen, and the Ambassador promised to forward it to the Foreign Office, in due course.

CHILE

Strike on State Railways

For some time past there has been a certain amount of discontent amongst some of the employees of the State Railways owing to the Government's refusal to accede to their demands for increased wages, a special bonus amounting to two months' pay and other benefits, concessions which the financial position makes it impossible to grant. Although the Government eventually agreed to pay a bonus of 20 days' wages, this did not satisfy the men, who thereupon declared a general strike as from midnight on January 14, in an effort to paralyse the entire service on all the national railways from Coquimbo to Oruro. The Government at once took commendably energetic measures to deal with the situation. Colonel Manuel Campos was put in charge of the running of the trains under military guard, with the assistance of pensioned railwaymen and other volunteers, and a proclamation was issued warning the strikers that they were engaged in an illegal movement, giving them a time limit within which to return to duty, failing which they would be dismissed from their posts, arrested and tried by court-martial. It is stated that about 150 strikers have been arrested in Santiago and Valparaiso, but up to the time of writing no acts of sabotage are reported. This is the first serious trouble on the Chilean railways since the revolution of 1932.

Funds for Port Works

One of the results of a recrudescence of prosperity in Chile and a general revival in trade is a marked activity in port extensions. Recent advices from Santiago are to the effect that, by Government decree, the sum of $5,820,000 (Chilean pesos), approximately £61,500, has been allocated for the carrying out of new works at the following ports:—Arica, $160,000; Iquique, $200,000; Antofagasta, $450,000; San Antonio, $1,800,000; Valdivia, $1,000,000; Puerto Montt, $300,000; Valparaiso, $1,300,000; Talcahuano, $110,000; Tocopilla, $150,000; Constitución, $50,000; and Magallenes, $300,000.

BRAZIL

Sorocabana Railway—Petition to Increase Tariffs

A special meeting of the Rates Tribunal, with the Secretary of Transport in the chair, took place recently in São Paulo to discuss a petition put forward by the Sorocabana Railway for an increase in tariffs. To support their request the management of the railway quoted the figures representing the wages bills for 1928 and 1935, an actual expenditure of 25,819 contos under this heading in the former year having risen to an estimated expenditure of 41,577 contos in the latter. Moreover, whereas in 1928 the railway paid out in salaries and wages an average of 224 milreis a man monthly, the corresponding amount at the present time was roughly 315 milreis, which indicated an increase of more than 40 per cent.

In a report on the subject submitted to the Rates Tribunal the Sorocabana declared, *inter alia*, that the complete revision of their tariffs was a matter of urgency and that their request for this to be done carried with it a threefold object:—(*a*) To secure a reasonable increase in receipts, (*b*) to modify the existing differences in the bases upon which each of their present class rates was calculated, and (*c*) to subordinate

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their tariffs, as far as possible, to the modality prescribed by the Ministry of Transport and Public Works. The report in question was favourably received by the tribunal, several of the members in their speeches endorsing the arguments adduced by the Sorocabana.

Projected New Railway in State of Paraná

According to news received from Curityba, the capital of the State of Paraná, the Federal Interventor there has signed a decree granting to the Banco Suissa-Brasileiro a 50-years' concession for the construction and development of a new railway. This railway will start from Rio Branco, the terminal point of a short branch from Curityba, and its main line, after crossing the São Paulo-Rio Grande line from Itararé to the south near Joaquim Murtinho, will link up with the São Paulo-Paraná Railway a short distance from Jatáhy, which at the present time is the rail-head of the latter system. In addition there will be two branches; one, leaving the main line at Socavão, will serve the towns of Castro, Tibagy and Reserva, and eventually reach Porto Mendes on the Paraná river facing Paraguay; and the other will leave the first at a convenient point and terminate at Porto Camargo, higher up on the same river and facing the State of Matto Grosso. Included in the terms of the concession is the colonisation of any lands that should be ceded to the Banco Suissa-Brasileiro by way of facilitating the projected construction.

SPAIN

The Gibraltar Tunnel

The Commission for the study of the Gibraltar tunnel scheme held a plenary meeting recently, in Madrid, when an account was given of the work carried out during the last half year. Some members of the Commission had visited the site of the proposed tunnel, various kinds of diving apparatus had been examined, and the way prepared generally for a survey of the sea-bottom which is to be made in the spring. Special importance was attached to the question of propaganda, and to obtaining the co-operation of the railway companies for the scheme, it being agreed that contact should be established with the company working the French Transafrican Railway and also with the Cape to Cairo scheme. Lt.-Col. Jevenois, the engineer in charge of the work, is visiting Paris and London to obtain technical and financial assistance for the scheme.

Norte & M.Z.A. Traffic Pool

The scheme which for so long has been the subject of conversations between the Northern and M.Z.A. Companies for pooling the traffic of the two systems, has at last been approved by both boards of directors, and now requires only the approval of the Minister of Public Works. Details have not yet been published of the form the pooling (or "syndication" as it is termed in Spain) will take, or of its extent, but it is known that its principal features are abolition of controls and checking at junctions, joint user of rolling stock, consigning of goods traffic by shortest route, unification of tariffs, and the formation of a special service for the co-ordination of road and rail. In drawing up the scheme, the pooling arrangements adopted by the four principal English railways have been studied, and have to some extent served as examples. If this scheme is approved by the Government, as no doubt it will be, it may well be the turning point in the history of the principal Spanish railways.

M.Z.A. Receipts

The latest published receipts of the Madrid, Saragossa and Alicante (M.Z.A.) Company show that the last few weeks of 1934 marked an improvement over the same period of 1933. Nevertheless this did not go far to make up the decrease in the aggregate, and 1934 constituted a low record for many years past. The constant fall in revenue during the last six years is very remarkable, as will be seen by the actual figures of total traffic receipts as follow:—

	Ptas.		Ptas.
1929 ..	326,360,000	1932 ..	289,460,000
1930 ..	316,800,000	1933 ..	283,160,000
1931 ..	289,920,000	1934 ..	280,040,000

Buffet Cars

Of the new buffet cars referred to in THE RAILWAY GAZETTE of January 11, those constructed by the M.Z.A. were brought into use on January 1 on the Madrid-Badajoz line. The Northern Company's cars also were to start running on February 1 on the Valencia-Barcelona, Madrid-Salamanca, Madrid-Valladolid and Coruña-Leon routes, and also on the *rápido* which it is proposed to run between Madrid and Oporto, via Avila, Salamanca and La Fregeneda. An indirect advantage obtained by this service, in addition to offering greater facilities to the travelling public, is the fact that it will enable timings to be reduced, as long stops for meals at station restaurants will be obviated. The cars are fitted with twelve small tables, and the same refreshments will be served as in any ordinary café or bar.

Second Class Sleepers

The M.Z.A. announces that on the express mails from Madrid to Badajoz, Madrid to Zaragoza, and Madrid to Alicante and Cartagena, second class sleeping berths are now available. The berths are exactly the same as have hitherto been used for first class sleepers, the difference now being that separate sleeping compartments are available for individual first class passengers, while second class passengers may use the two-berth compartments at lower rates.

IRELAND

Road Haulage Firms Absorbed by Railways

In connection with the transfer of road haulage undertakings to the Great Southern and Great Northern Railways, referred to in THE RAILWAY GAZETTE of January 18, it is now reported that, although no compulsory acquisitions had been permitted under Section 54 up to the end of last year, two voluntary acquisitions took place, Leix Lorries Limited and Patsy Transport Limited, both of which are now absorbed by the G.S.R. By the end of the first week in January, however, the Minister for Industry and Commerce had issued compulsory acquisition orders in respect of three out of the first 10 applications then lodged by the G.S.R. Subsequently, further applications, bringing the total up to 36, have been made by this railway, the area covered by them extending over almost the whole of Southern Ireland.

Meanwhile, the Great Northern has had the businesses of P. McCloskey & Sons, and T. Cooney, both of Drogheda, transferred to it, in spite of protests from the Drogheda civic, harbour and commercial authorities. All the employees of the firms have been taken over, and Mr. Patrick McCloskey, the principal of his firm, has been appointed road haulage manager for the railway. The Minister is making it clear to objectors that if railways are to survive they must obtain control of road transport, and it seems probable, therefore, that most objections will be over-ruled and few exceptions, if any, made.

Londonderry & Lough Swilly Railway

For some time past traffic on the Londonderry & Lough Swilly Railway has been very light, especially on the Letterkenny-Burtonport and Buncrana-Carndonagh extensions. Though the head offices of the company are in Londonderry, Northern Ireland, practically the whole of the 99-mile system is in the Free State, and therefore comes under Southern Ireland road administration. The company started to run bus services in 1929, and, as passengers preferred the buses to the railway, the road fleet has grown, until now practically all the traffic upon the extensions just mentioned has deserted them for the bus services. Were it not for the 50,000 tons of merchandise and minerals and 30,000 head of livestock carried by the railway as a whole, there would be little justification for maintaining it as such. As it is, the company has, in accordance with the Free State Road Transport Act of 1933, submitted a proposed classification of merchandise by road transport to the Railway Tribunal in Dublin, and there are other indications that at least the two extensions are likely to be closed down

in the near future and replaced by road services, goods as well as passenger.

Proposed Branch Line in Leitrim for Iron Ore

Reports in connection with the working and development of the Arigna mines, in County Leitrim, indicate that a twelve-mile branch line from the Great Southern Railway to the mining area is being considered. In the past the inaccessibility of this area has precluded the extraction of iron on a commercial scale, as it is found only in difficult country in the Leitrim mountains, and a railway will be costly. However, there seems a possibility that the Free State Government may be induced to make an advance under the Trade Loans Guarantee Act, and this will go far to assist the private company which is to construct the line. Meanwhile coal, also mined locally, is pronounced as suitable for carbonisation by a new process, and machinery for an experimental pig iron extraction plant is being purchased from a French firm and will be installed at Bullock Harbour, Dalkey, within the next few months.

SOUTH AFRICA

Functions of Railways and Harbours Service Commission

In THE RAILWAY GAZETTE of January 18, the establishment of a Railways and Harbours Service Commission for the purpose of making recommendations for the filling of posts in the railway service, was recorded. The personnel of this commission was also announced in the issue of February 1, but although, under the heading of "Increased Power for Minister and General Manager," in the earlier issue referred to above, some of the functions of the commission were briefly mentioned, the following outline of its powers will give a clearer understanding of its duties.

The Commisssion is empowered to make a recommendation in respect to the appointment of a person to the position of an officer in the service in other than a casual capacity. It will also examine nominations for the promotion of officers to higher posts, and make a recommendation in regard thereto. In the case of appointments or promotions to positions valued at more than £1,500 per annum, the recommendation will be forwarded to the General Manager for transmission to the Minister with his recommendation. In the case of appointments or promotions within the powers delegated to the management, namely, valued at not more than £1,500 per annum, the recommendation will be made to the General Manager and in the case of appointments or promotions within the powers delegated to heads of departments and certain other senior officers, the recommendations will be made to the officers concerned, through the management.

The commission will not function in connection with salaried appointments valued at not more than £600 per annum (including value of free quarters) the duties pertaining to which involve responsibility with respect to the use or safe working of the railways and harbours or any other transport services controlled by the administration. The commission is not empowered to make appointments, and any approach to the commission by the staff either directly or indirectly in respect of any appointment, promotion, transfer or preferment of any kind is strictly prohibited.

ITALY

Cheap Tickets and Traffic at Milan

Honeymoon tickets have now been extended to Palermo, Sicily, for the period March 25 to April 25 and are available for foreign travellers as in other parts of Italy. The new week-end and holiday reductions which came into force on December 1 last are proving a great success, to judge from the figures just published for the Milan Division. Whereas in December, 1933, some 38,000 holiday tickets producing £13,000 were sold, the number of such tickets in December, 1934, amounted to 125,000 and the receipts to £29,000. Tickets for parties issued at a reduction of 70 per cent. numbered 1,402 with over 12,000 participants, whereas in the previous years the number of party tickets never reached 100.

Milan Central, the busiest of all Italian stations, dealt with 134,584 trains during the year 1934, an increase of 4,835 over 1933. The number of tickets issued has increased in the past two years by 174,926 (about 7 per cent.), but the receipts have decreased by £62,129 (about 4¾ per cent.), due to the many tariff reductions or concessions for special occasions and the institution of the special Sunday trains.

CHINA

Peiping (Peking)-Mukden (Liaoning) Accelerations

The revised timetables effective since January 1 reduce the express schedule times between Mukden and Peiping by three hours and Peiping and Mukden by one hour. The through express leaving Mukden at 2 p.m. now arrives in Peiping at 9.45 next morning.

Shanghai-Peiping Express Service

The 1,462 km. (906 miles) between these two cities are now covered by the daily express in just under 42½ hr. in the northbound, and 40 hr. 35 min. in the southbound direction, the journeys including the crossing of the Yangtze by train ferry. There are five rakes in constant use and two in reserve or under repair. First and second class sleeping and day cars and also third class accommodation are provided and the trains are very up-to-date and comfortable.

Second Class Sleeping Cars

Commencing on January 1, the Nanking-Shanghai and Shanghai-Hangchow-Ningpo Railways introduced second class sleeping cars on the night express trains between Nanking and Shanghai and between Shanghai and Hangchow and *vice versa*. The charge for an upper berth is 2·50 Chinese dollars and for a lower berth C$3·00 for any distance, these charges being equivalent to 3s. 4d. and 4s. 3d. respectively at the prevailing rate of exchange.

Lung-Hai Railway Expansion

On the western extension of the Lung-Hai Railway, the first (test) train ran through to Sian-fu on December 20, and a public service started on December 27, somewhat earlier than expected. The Ministry of Railways has decided to push on this line further westwards beyond Sian to Sienyang in western Shensi at once, and it is expected that this extension will be opened before the end of this year. The Managing Director of the Lung-Hai Railway states that all engineering work at Lieyunkang, the new eastern terminal port of his system, is likely to be completed by April next.

CZECHOSLOVAKIA

Rolling Stock for Bulgaria

Under a "compensation deal" with Germany, Austria, Czechoslovakia, and Hungary, 909 million leva worth of goods for Bulgarian State departments are to be delivered in exchange for Bulgarian tobacco. The deal will include rolling stock to the value of 427 million leva, and in it are 12 locomotives.

Czechoslovak State Railway

Receipts, which have been improving, showed a further advance in November, totalling 256·5 million crowns, or 17·6 millions more than in November, 1933. Freight receipts improved by 15·3 millions and passenger receipts, which had previously been somewhat lower as a result of reduced fares, also showed an upward tendency by 0·8 million crowns. Parcels receipts also improved slightly.

JAPAN

Inauguration of Passenger Service through Tanna Tunnel

At 0.40 hr. on December 1 a second and third class express passed through the Tanna tunnel, thus inaugurating the passenger service over the new route. The 7·807 km. length of the tunnel was traversed in 9 min. 3 sec., and a saving of 20 min. is effected on the Tokyo-Kobe service.

XUM

RAILWAY MAINTENANCE PROBLEMS, II—DRAINAGE

By Lt.-Col. H. A. HULL, M.Inst.C.E., District Engineer, Northampton, L.N.W.R. & L.M.S.R., 1918-33

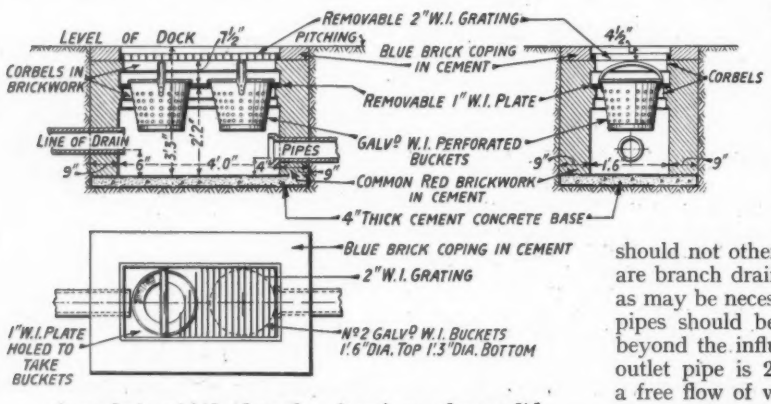
Notwithstanding all the knowledge now available in print, some of the most essential and elementary facts are often ignored. There are always pioneers at work, on whose heels follow those with ingenious minds to record their results as formulæ for the future guidance of the unimaginative or timid.

THE drainage of railways is of great importance, and, although main drainage usually receives the attention it deserves, subsidiary drainage is sometimes neglected. In the first place it is essential that a record of all drains and culverts should be kept. It is also important that those locally in charge of maintenance on the ground, such as district inspectors and gangers, should not lay in drains on their own initiative. Their suggestions should be put up to their head office where they can be examined in conjunction with the existing drainage system. Any new drains then sanctioned can be properly recorded.

The indiscriminate laying of drains during the construction of new lines or the widening of old was common in the past, and sometimes had the effect of trapping water rather than conducting it away. On the other hand, it is advisable to lay drains or culverts in certain circumstances during new construction, even in places where there may be no evidence of watercourses at the time.

The omission to provide pipes or a culvert at the deepest point of every embankment crossing a valley has been known to lead to the blocking up of temporary watercourses in wet weather, and has necessitated expensive boring work later.

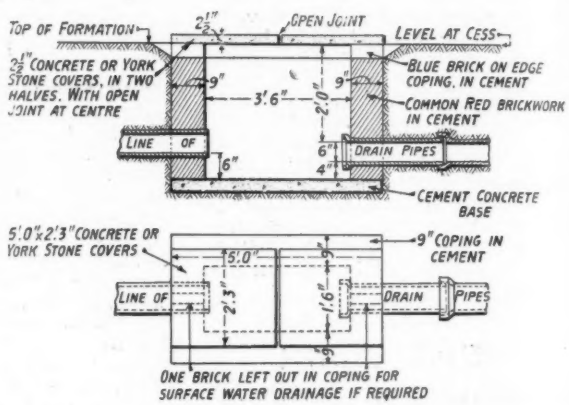
Some examples may be given of the trouble that can arise from the indiscriminate laying of uncharted drains. The cause of a sudden flooding during a wet spell of the passenger subway at Nuneaton was eventually traced to a broken pipe in an unsuspected drain in the goods yard. At the time of the flooding a subsidence had occurred in the goods yard at a spot about 150 yd. from the subway. Excavation revealed a broken 18-in. earthenware drain covered over with timber which had decayed and let down the weight of the earth above. The immediate cause of the blockage was a 12-in. wooden ball, one of two introduced by a previous district engineer into the local drainage system at a known catchpit and left to wander about with the idea that, in doing so, they would scour out the drain. Grids at the outfalls prevented their escape.



A catchpit with buckets for situations where solid matter is liable to accumulate in the drain

The practice of laying timber over broken pipes or waterways where it will be covered with earth and lost to sight is to be avoided. The writer recalls an instance of a dumbwell so covered in a cottage garden over which a widened embankment was tipped. In the course of time the wood rotted and caused a subsidence in the running line above it, fortunately discovered in time to prevent mishap.

The haphazard laying of a 9-in. earthenware drain to take a small stream which was flowing harmlessly along the toe of a cutting slope gave rise to trouble in a certain instance. Not having been put down to a proper slope, it permitted water to lie at certain low places and eventually to saturate the formation and cause trouble in maintaining the top of the adjoining line. The drain had eventually to be relaid to a proper fall.

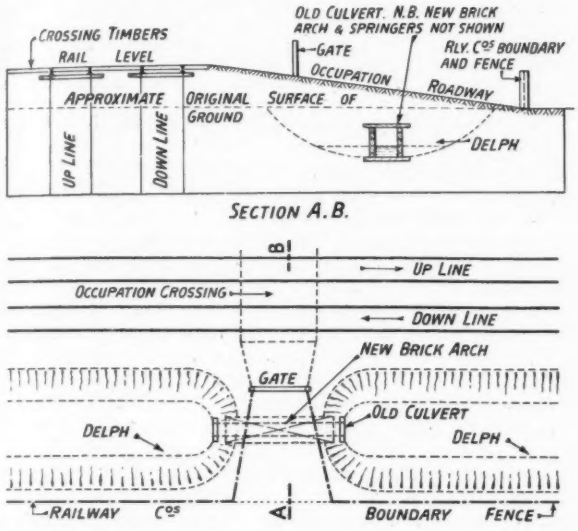


A type of catchpit which has been found successful as a side drain in cuttings

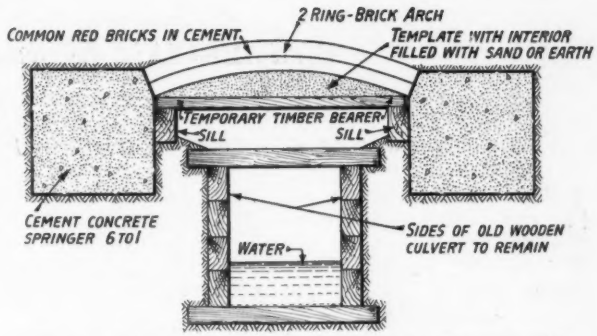
The number of types of side drains laid in cuttings by different engineers is legion, and the author has had to deal with many in which time has revealed serious faults. As a result of experience, he considers the catchpit illustrated above to be the best. With the exception of the cover, it should be built entirely on the ground. Such pits should not be more than a chain apart, so that they can be completely rodded, and, although the depth may vary according to that of the drain, they should not otherwise be smaller than shown. Where there are branch drains they must, of course, be as much larger as may be necessary for ease of rodding. The depth of the pipes should be at least 2 ft. below ground so as to be beyond the influence of frost. It should be noted that the outlet pipe is 2 in. lower than the inlet so as to ensure a free flow of water and that the pipes shall be empty in dry weather. The author considers 6-in. pipes to be big enough for ordinary purposes.

The catchpit shown in the drawing on left is of a type found satisfactory by the author at places, such as cattle docks, where solid matter is liable to be carried down by the liquid. The buckets are periodicaly emptied. When it is necessary to rod the pipes, the intermediate plate carrying the buckets can be removed.

Drainage of water from station roofs has not always been given the consideration it deserves. Unless proper means for clearance are provided at the foot of cast-iron columns or downpipes there is a liability for them to become choked with the fine ashes from the locomotive blast. One winter, during a hard frost, and because of the obstruction of the outlets at the bottom of the columns carrying a large span roof over a certain terminal station on the former L.N.W.R., the whole roof was lifted bodily on pistons of ice. When the thaw set in the roof descended to its original level without damage to the main structure, though some of the glazing and slates were broken.



Section and plan of culvert arrangements adopted at occupation crossings on the Blisworth-Peterborough branch, L.M.S.R.


2 RING-BRICK ARCH
COMMON RED BRICKS IN CEMENT
TEMPLATE WITH INTERIOR FILLED WITH SAND OR EARTH
TEMPORARY TIMBER BEARER SILL
SILL
CEMENT CONCRETE SPRINGER 6 TO 1
WATER
SIDES OF OLD WOODEN CULVERT TO REMAIN

Method of renewing culverts without interference with the flow of water

In order to raise the Blisworth and Peterborough branch line, which follows the valley of the River Neve, above flood level, borrow pits, locally called " delphs," were formed by the excavation necessary to make the embankments. At the frequent occupation level crossings these delphs, which were used as side ditches, were bridged by means of timber culverts of the design shown. When it became necessary to renew them, the author adopted the method illustrated in the drawings which reduced falsework to a minimum and avoided any interference with the flow of water.

The use of syphons to carry water across cuttings is economical in first cost and entirely successful, provided suitable provision is made at the entrance and exit to prevent animal life nesting in the pipes when they are empty, and driftwood or vegetation being carried into them when water is flowing. The author has never experienced any trouble from sediment accumulating at the bottom of a syphon.

[*We hope to publish the next article of this series in our issue dated March* 15.]

GRAND UNION CANAL DEVELOPMENTS

The Grand Union Canal Company took over on January 1, 1929, and amalgamated the properties of six undertakings operating between London and the Midlands, and the merger resulted in through routes between London, Birmingham, and Nottingham being brought under unified control as regards both traffic and standard of maintenance. In May, 1931, the company took in hand a £1,000,000 intensive development scheme with the assistance on one-half this amount of a grant of interest made by the Treasury under the Development (Loans, Guarantees, and Grants) Act, 1929. The main programme of work included walling and piling the banks of the canal over long stretches and extensive dredging to enable the passage of craft with a draught of 4 ft. 6 in. throughout the system. On the Warwickshire system some 51 new locks have been provided, and this phase of the scheme was successfully completed at the end of October last, when the Duke of Kent formally opened the new works. These have made it possible to navigate between London and Birmingham boats of 12 ft. 6 in. beam and capable of carrying loads nearly twice as great as those of the familiar " monkey-boat " type of canal craft with a beam of 7 ft. The Grand Union Canal Carrying Co. Ltd. recently ordered a large number of new craft, and so as to secure delivery of 50 pairs (each pair comprising a self-propelled boat towing a " butty ") before the end of the present year, distributed the orders round several shipbuilding yards. (*See illustration on page* 291.)

XUM

COMMERCIAL RESEARCH ON THE L.M.S.R.

The commercial research section, instituted as an experiment on the L.M.S.R., has now been confirmed as a permanent feature of the Chief Commercial Manager's department

As part of the reconstruction scheme of the L.M.S.R. commercial organisation embarked upon in 1932, a section composed of specially selected staff was set up to conduct research into commercial aspects of the railway services. This is quite a new feature of British railway organisation.

The subject of research when associated with the purely commercial aspects of any business of the magnitude of the railway services must be of an abstract character to some extent, and its effective pursuit must frequently take the research worker into fields of investigation outside the sphere of ordinary railway data. The headquarters organisation of such an undertaking normally comprises a series of departments each charged with the day-to-day administration of a section of the work of the concern. The volume of work involved, moreover, is usually so great that the administrative staff is fully absorbed in handling, according to defined policies, the matters arising from day to day, and so not only does lack of time preclude the adequate study of problems upon which policy may be moulded or modified, but frequently the administrative work calls for, and is done by, a type of mind not best fitted for handling abstract problems. Work of the "laboratory" type consequently calls for the segregation of specially selected staff to investigate and consider problems in an atmosphere of detachment and freedom from the distraction of routine.

Basis of Research

The aim of the research section is not, however, to evolve mere academic theories, and, in order that it may fulfil its function in the consideration of practical problems besetting the railway service, a "laboratory" staff must be well in touch with the work done by the routine departments. Its objectives should comprise both the creation of that which is new and the refinement and/or expansion of that which exists; promotion of new services, revision of methods, and the examination of principles are all pertinent factors in a commercial research department. The L.M.S.R. commercial research section has three main functions:—

(i) The pursuit of lines of inquiry or new ideas initiated within the department;

(ii) The consideration of problems arising in the practical departments and delegated to the research section for examination and report; and

(iii) The investigation of subjects remitted to the research section by officers of the company.

Matters developed to a final or successful stage are immediately passed to the practical departments for information or application as the case may be.

Apart from tangible considerations arising out of practical problems, a good deal of research commences with a theory either as to the causes of a specific circumstance or the effect of a given remedy if applied, but to be successful it has been found not only beneficial but in some cases almost essential to couple up some lines of investigation with a certain amount of actual test, on the basis of trial and error initiated by the research worker himself. Any penetration by the research department into the practical side may seem on the face of it to be a negation of the principles which have been responsible for the creation of the research staff; this is not, however, the case. It could equally well be argued that an inventor or a scientist having propounded a theory should leave its development in the hands of the practician. This may be unsound from several points of view, *e.g.*:—

(*a*) Practical test sometimes shows that original theories have to be modified or abandoned;

(*b*) If the author is qualified in his subject, no one can better test his theory than himself, because he will have a more intimate knowledge than anyone else of the data and related facts upon which the particular theory or scheme is based; and

(*c*) Human nature being what it is, a certain amount of conservatism is frequently found in the mind of the average practician—whatever his calling—and either from this cause, or the reason given in (*b*), there is a risk of failure to translate theory into accepted practice.

It will be conceded as an elementary fact that ideas on any subject—other than pure conjecture—must be based upon some knowledge of that subject. Such knowledge may rest upon a foundation which may be physical, statistical, social, political, or economic; in fact, most matters concerning railway traffics and commercial practice have features associated to a greater or lesser degree with all five heads. It is more or less essential, therefore, that all problems—whether they represent a new line of thought, or an analysis of existing practice or policy—must be examined as far as possible under each of the five heads and with due and adequate regard to the ever changing nature of the national life. This naturally entails the inspection of existing statistical records or the compilation of special data peculiar to a particular problem.

If the problem be related to a specific trade or industry, then it is necessary for the investigator to study the requirements of that trade or industry, and the more one can learn of its internal structure—viewed from the traders' standpoint—the sounder will be the judgment formed as to the policy or action to be adopted in the best interests of the railway. This feature calls for direct contact between the investigator and the trader, and as a medium of progress it is found to be more effective when the collaboration takes the form of an actual transaction with the traffic of the interested trader, rather than a theoretical discussion relative to the traffic of his industry as a whole.

Statistical Aid to Research

It is not the aim of the L.M.S.R. commercial research section to produce general statistics, but to use and make deductions from those produced within the normal departmental organisation, or elsewhere, which have a bearing upon the work of the research staff. In the consideration of certain problems, especially those arising out of present day changes in our national economy, for example, the agricultural marketing schemes, it is inevitable that the statistics ordinarily available are insufficient in detail or inadequate in range to enable a proper conception of the situation to be formed. In such circumstances the research staff, after an initial study of the question, arrange for appropriate statistics to be prepared. Whilst the use of statistics of various kinds plays a prominent part in the everyday work of the research staff, care has been taken from the outset to prevent the research section from becoming in any way a statistical machine, or so imbued with a statistical outlook as to lose contact with or fail to grasp the practical facts of which the statistics are a reflection.

The staff of the L.M.S.R. commercial research section consists of an Assistant-in-Charge, a Deputy-Assistant, together with a specially selected personnel of sixteen

investigators and essential clerical staff. It was recognised at the outset that in order to secure the best results from a specialised section of this nature its activities would require to be based upon a code of principles defining in the abstract the scope and nature of its functions; these were duly set forth in a charter which now forms the basis of the research section's activities.

Every man—both senior and junior—has been encouraged to develop new ideas and suggestions, and in this respect new ground is broken in two ways:—

(1) by the section setting itself questions which challenge existing practice, and seeing where the answers to such questions lead; or

(2) by a systematic review of existing services, facilities and records, including past files of suggestions from the public, staff, and so forth.

Unfortunately, it has been too commonplace an experience of the past for many intrinsically good ideas to be turned down without mature thought, and there is undoubtedly a considerable measure of bias in the mind of the average man against the adoption of anything savouring of a departure from precedent. The research section, therefore, aspires to be a challenge to precedent.

The potentiality of the first-named field of exploration, *i.e.*, the setting of problems, depends, of course, upon the vision and initiative displayed by the individual members of the research section. Laymen to railway affairs frequently ask the " why " and the " wherefore " of some feature of railway orthodoxy; the question may be addressed to a railwayman who has regarded that feature hitherto as " established " and may never have thought to question it. The members of the research section have, therefore, been encouraged to put themselves into the attitude of " enquiring laymen," setting themselves questions and demanding an answer. A searching analysis of the matters and reasons thus disclosed has led to alterations or improvements commercially advantageous to the public and to the company.

The analytical chemist, confronted with a material, the constituents of which are unknown, selects a sample from the mass, and proceeds to examine it, knowing that his findings in the sample will be true of the mass, provided the sample be typical. Again, the inventor, possessing an idea which he proposes to adopt on big operations, will construct a model embodying his idea, with readiness to adapt and adjust as experience with the model will suggest, believing that what is true of the model will be true in general practice.

Progress of the Section

These are the broad principles which govern the activities of the new research section. No limitation whatever, however, has been placed on the type of subject which may be relegated to or initiated by the research staff; its horizon is as wide as the entire commercial sphere of the railway service. It is interesting to note in this connection that during the relatively short span of its existence the L.M.S.R. commercial research section has investigated and reported upon such diversified matters as the agricultural marketing schemes with special reference to milk traffic, reorganisation of fishing industry in relation to distribution, effect upon rail interests of shipping subsidy, the regulation of the loading of passenger trains, seat reservation practice, special analyses leading to maximum development of excursion facilities, refrigerated and insulated transport of fish, fruit, flowers and other perishables, cash-on-delivery service, film publicity, improvements in sleeping berths, analyses of streams of specific merchandise in relation to road competition, principles relating to conveyance of liquids in tanks, and a complete survey of the potentialities of a typical rural area.

Necessarily, research of this kind will be most successful if the personnel engaged upon it are selected for their flair for such work. They must possess originality of thought and outlook, and, above all, minds entirely free from prejudice even if asked to demonstrate that black is white. They must always be prepared to throw out a challenge to existing practice, and to regard precedent as a matter of importance only when they themselves contribute to the establishment of precedent.

TRACK-RECORDING ON THE G.W.R.

For some years past the Great Western Railway has adopted a novel method of marking *in situ* inequalities in the track which are likely to cause unsatisfactory riding of rolling stock. A bogie coach has been specially allocated to this work, and fitted with an apparatus which, when the movement of one of the bogie frames relatively to the coach body exceeds a certain predetermined maximum, operates a valve fitted to the outlet pipe from a storage tank containing whitewash, and so causes a white splash to be made on the track. Actually, the momentary lapse of time from the communication of the impulse to the release of the whitewash, while the coach is travelling at speed, makes it necessary to look for the cause of the oscillation at a point on the track from 50 to 100 ft. in rear of the splash. This special vehicle, which is marked externally " Experimental Coach," and is known officially as the " Whitewash Van," is run over all the principal routes of the G.W.R. to a scheduled programme, attached to the rear of ordinary express trains. The car carries a Hallade track-recording machine, which has been fitted with an additional pen, so that the points at which whitewash has been dropped may be duly marked on the roll; a speedometer is also fitted. Care is taken to keep the coach in first-class condition, and the tyres are not allowed to become unduly worn. The advantage of devoting a special coach to this work is that the factor of varying degrees of oscillation produced by variations in the suspension of the different coaches in which the records are made is eliminated. The information obtained on a series of runs over the same route, including the Hallade records, is thus to a large extent truly comparable, and provides a history of the condition of the track over each route.

THE RETIRED RAILWAY OFFICERS' SOCIETY. — In our Personal columns this week will be found the announcement of the election of Mr. W. F. Pettigrew as President of the society. This event is of special interest as he is the first ex-Chief Mechanical Engineer to hold the office of President. The names of the officers of the society re-elected for the current year are also given on the same page, and it may here be noted that the address of Mr. W. A. Thomas, the Hon. Secretary, is 306, Bristol Road, Edgbaston, Birmingham. Also in our list of forthcoming events will be found the announcement that the annual luncheon of the society will be held on March 11 at the Abercorn Rooms, Liverpool Street Station Hotel. Mr. William Whitelaw, Chairman of the L.N.E.R., will, we understand, be the principal guest. Although the Retired Railway Officers' Society can boast of an excellent membership, there is still room for many others eligible to join, to whom a warm welcome would be extended by the new President.

XUM

RAILWAY WHEELS AND AXLES

I—The evolution of machining methods and other preparatory operations

By C. D. ANDREW, M.I.Mech.E.

DURING the post-war period it must have been evident to all users of machine tools at home and abroad that the rate of progress in the design and efficiency of such machines has been quite extraordinary, and in this forward movement machinery intended specially for use in railway workshops has had its full share of attention. By a fortuitous combination of circumstances, a complete revolution has been brought about, due to the enterprise of metallurgical chemists and steel manufacturers, in the quality of material available for the use of machine tool makers, without which such remarkable progress in the productive capacity of machinery would have been impossible. Machines of general utility in the workshop, whether for railway or other service, such as automatics, capstan, turret, and combination turret lathes, radial and vertical drilling machines, slotting machines, planers, grinding machines, milling machines and so on, have developed even in the last decade to an extent beyond what would have been conceived possible at the beginning of that period.

This close concentration on the improvement of machinery and the materials used in its construction and operation has been of an international character due to the urgent need of reconstruction after the war period, and to the necessity for quickening the rate and reducing the cost of production. Perhaps the most important factor in the progress made has been the introduction of higher speeds of operation, made possible by the use of special alloy tools such as Cutanit, Ardaloy, Widia or Wimet, which have had the effect of making more or less obsolete the older, and at least the medium and lighter classes of machines used in railway shops. Ball and roller bearings have been developed in design to meet these conditions, which have also led to the more universal use of ground spindles and gears, automatic lubrication, heat treated material, and, in general, components of a higher physical quality.

It is worth noting in this connection that the improvement in the quality and variety of steel material has had an important effect on smithy operations, formerly supreme as the "halfway house" between the forge and the machine shop. Smiths' work was, in the experience of the pre-war generation of engineers, an expensive item both in time and cost, and it is not so many years ago that almost all of the steel components of machines had to pass through the hands of the smith to be hammered, drawn down and generally wrought upon, leaving as little material as possible to be removed in the machine shop. To a great extent this has been eliminated by the introduction of alloy steel sections, heat treated material, and the greatly increased capacity of machine tools to remove excess material, as well as to the increased use of drop stampings. No claim is made that it is always economically desirable to remove much excess material by machining; in the case of railway axles, for instance, it has been found by recent experience that it is better to reduce the forged dimensions to a greater extent than was formerly the practice, and this applies also to tyres.

Increasing Productive Capacity

Up to the present it has not been fully demonstrated how far the use of tungsten carbide tools can be carried in railway work, and for many of the major operations on railway material high speed tools of 18 to 22 per cent. tungsten steel are still in satisfactory general use on certain parts. It was about ten years ago that an appreciable advance was made by the use of 18 per cent. tungsten steel with cobalt content, one of the uses of which was for the re-turning of hard tyres. About six years ago cemented tungsten carbide, a product of the Krupp works, began to come into general use in this country and the U.S.A., and was found to be efficient at extraordinarily high speeds on cast iron and brass, as well as on nickel steel material, the finish produced being also exceptionally glossy. But for mild steel the use of coarser feeds with tungsten steel tools still remains common practice.

The investigation of practicable cutting speeds has naturally had some remarkable results on the design of machine tools, so that in the past five or six years during which the carbide tools have been put to general use, there has developed a keen international competition to see who shall show the greatest productive capacity, the actual economic aspect being left, as it were, in abeyance. English, American and German machine makers have been, as usual, the principal competitors. A striking feature has also been the concentrated attention given to this subject by Russian technical experts. There has in consequence been little room in this period for a "breathing spell," and perhaps it is to be hoped that further revolutionary changes will be delayed sufficiently to enable designers to consolidate their ideas and methods, and so allow the actual economic conditions in the manufacturing world to be examined and established. Of one of the important processes in railway workshops it may be noted that, at the beginning of the post-war period, if a pair of wagon wheels were re-turned after service in 35 minutes, that was considered to be a reasonable performance, but at the present time 7 or 8 minutes is possible. During the same period improvements in automatics and capstan lathes due to the use of the very high speeds obtainable, have resulted in an increase of productive capacity by 300 to 500 per cent.

Electrical Drive and Control

Keeping pace with the advances made in other directions, a further great change has resulted from the development of electrical apparatus. This is manifest in the elimination wherever possible of belt transmissions and the common use of drive by independent motors of not only the main gearing of the machine but also of traversing parts and feed gearing; it is also seen in push-button and other forms of centralised control. The needs of the increased and almost universal use of motor drive have been met by a tremendous increase in the supply of alternating current and its transmission at high tension throughout the country.

As to available materials of manufacture, the introduction recently of synthetic resin may be mentioned. This is still in its infancy, but we may expect to hear more of it in the near future. It possesses considerable mechanical strength, and is already in use for certain electrical details and textile machine parts, small noiseless gears and so on. The possibilities of this material

might well be investigated by machine tool makers, for such purposes, for instance, as handwheels, change levers, covers, and gear pinions, since resistance to abrasion is one of its characteristics.

Methods of Handling Material

As a natural sequel to the considerable speeding up of production which has occurred, the handling of material in its passage through the workshop has become one of great importance and worthy of the closest attention, if the benefit of rapid machining is not to be annulled by the time and labour required for handling, especially of the heavier classes of units.

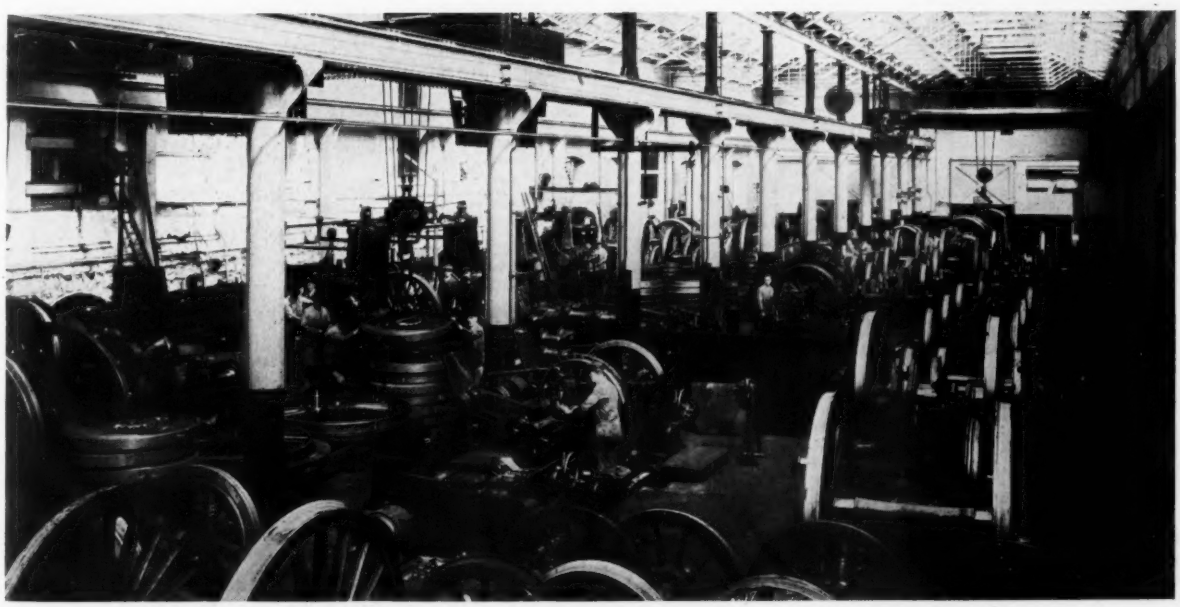
In the case of operations on the lighter classes of material, such as bar stock and parts to be dealt with on chucking lathes and small centre lathes, the handling question has in general been satisfactorily dealt with by the marshalling of the material at a central point, attaching identification tags or job tickets wherever possible, and distribution to the machines by means of electric or petrol trucks. There remains now the question of the most suitable way in which to deal with the much larger bulk of cuttings produced during high speed operations, and it would appear that there is room for full investigation into the matter of chip breaking, and the segregation and final disposal of the cuttings. In this respect increased production in many cases has gone ahead of the facilities available for clearance of the cuttings, especially where the grouping of machines or layout of floor space has made no particular provision for such a contingency.

The design of modern machines has in most cases made provision for the clearance of chips through openings in the structure of the bed, and in dealing with cast iron this is quite practicable, but for rapid turning of tough steel material, which flows off the tool in large spirals and is not easily breakable the problem still calls for solution. Highly tenacious cuttings flowing off at a rate of several feet a second, unless kept under control, are liable to provide a certain element of danger, and they cannot be broken but must be cut. Presumably development in method will lead to some modification of the saddle design of the machine, say by the extension of the saddle surface and the provision of an adjustable chute to receive and convey the cutting, passing it through a pair of small rollers with cutting faces, rotated by the forward movement of the cutting itself, and thence diverting it through the bed of the machine in manageable lengths. It seems obvious that any cutting method not controlled by the movement of the cuttings as it leaves the tool would cause banking up.

It has been the practice for many years in the case of wheel lathes and others of the larger types of railway machines, to provide a pit in the foundation of the machine, and a steel box or truck to receive the chips falling through the bed. When ready for clearance this receptacle is rolled into a lateral extension of the pit, to be lifted out by the shop crane. This method, of course, takes up considerable floor space, and it would appear to be a practicable arrangement, where permitted by the layout of the shop, or of new installations, to provide a continuous culvert or pit say 2 ft. 3 in. wide under the machines, with the space between one machine and the next covered in. A suitable simple form of conveyor could then be installed in the pit, serving a row of machines and operated at intervals to convey the chips to the end of the shop for storage in bins or direct loading.

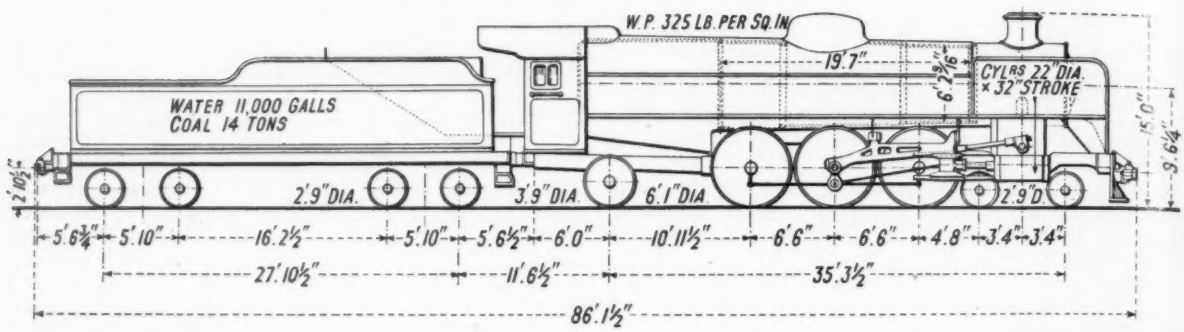
Such a culvert would at the same time provide a means for carrying off the waste water now sometimes used in the machining of wheel tyres, also the coolant used when machining axles, &c. In fact, so far as the coolant is concerned, a common trench or culvert is already in use in some workshops.

Reference has already been made to the greatly increased output capacity of wagon wheel lathes. To any railway engineer examining the capabilities of the latest types of such machines, it must be a matter for study how far the possibilities of marshalling and generally handling the wheels, with existing workshop layouts, can be made to co-ordinate satisfactorily with machining capacity. This question will be considered in a subsequent issue.



A view in the wheel shop at Derby locomotive works, L.M.S.R. These were fully described and illustrated in a series of articles published in "The Railway Engineer" during 1930 *and* 1931

REBUILT 4-6-2 EXPRESS PASSENGER LOCOMOTIVES
DELAWARE AND HUDSON RAILROAD



ON page 710 of THE RAILWAY GAZETTE of November 2, 1934, we reproduced a photograph of a rebuilt 4-6-2 type locomotive exhibited by the Delaware & Hudson Railroad at the Century of Progress Exposition, Chicago.

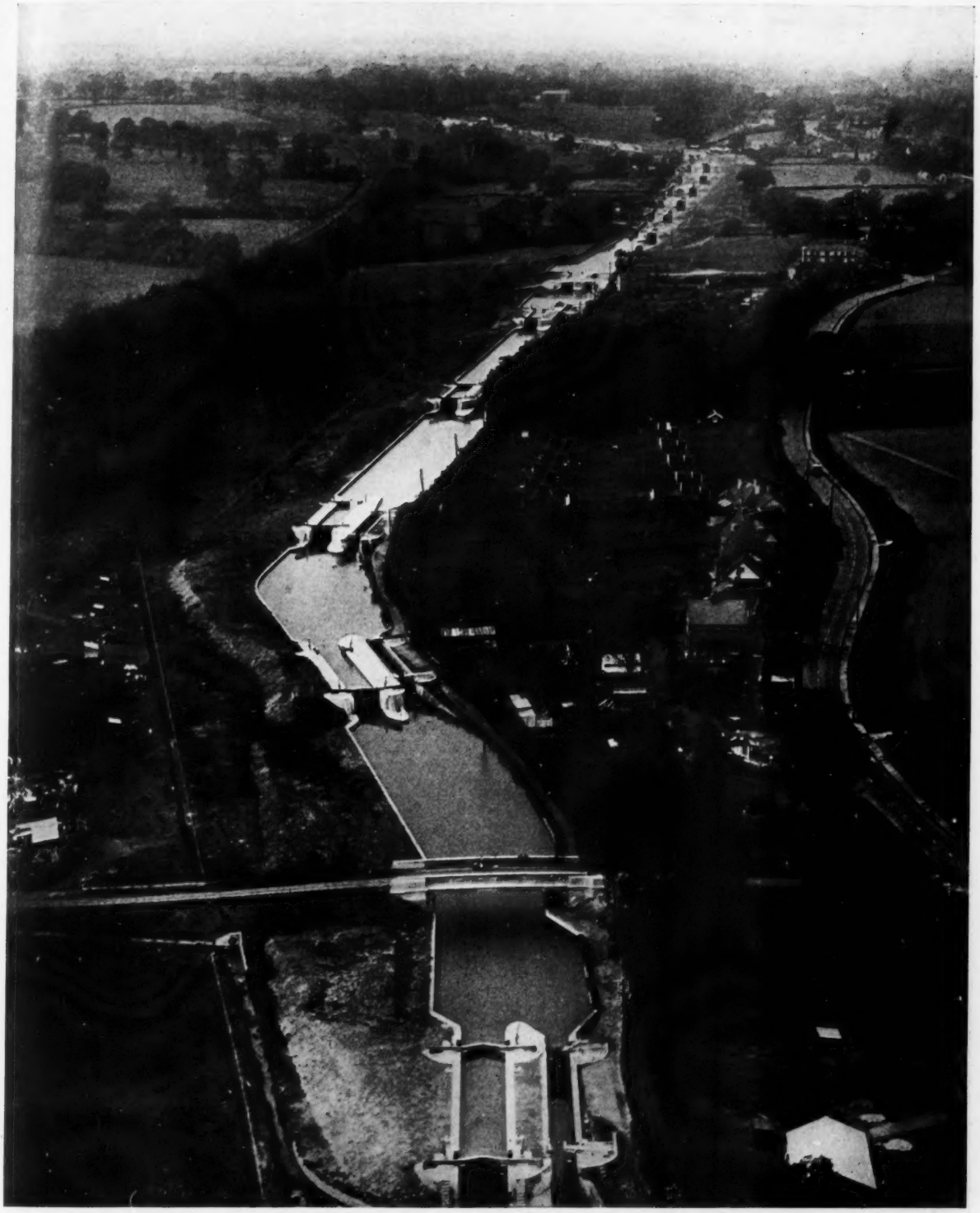
The engine, which is fitted with R.C. poppet valves and gearing, weighs 132 tons 7 cwt. in working order, and with the tender complete, approximately 204 tons. The tender is carried upon two four-wheeled bogies and has a tank capacity of 11,000 U.S. gallons of water and 14 U.S. tons (2,000 lb.) of coal. The simplified appearance of the engine, and the fitting of side plates for smoke deflection, give it to some extent a European, or more correctly, perhaps, an Anglo-American appearance.

In a communication we have received from Mr. G. S. Edmonds, Superintendent of Motive Power of the railway, we are informed that this engine is now in experimental service. By his courtesy we are enabled to reproduce herewith a dimensioned outline drawing, and in addition give the following particulars, which were not available at the time that the illustration appeared:—

Cylinders (2), dia.	22 in.
Piston stroke	32 in.
Wheels coupled, dia.	6 ft. 1 in.
Bogie wheels, dia.	2 ft. 9 in.
Trailing wheels, dia.	3 ft. 9 in.
Wheelbase, coupled	13 ft. 0 in.
,, total engine	35 ft. 3½ in.
Boiler, dia. at front	6 ft. 2 9/16 in.
,, length between tube plates	19 ft. 7 in.
Working pressure	325 lb. per sq. in.
Heating surface, fire tubes and flues	2,925 sq. ft.
,, ,, arch tubes	37 sq. ft.
,, ,, firebox	283 sq. ft.
Evaporated heating surface	3,208 sq. ft.
Heating surface, superheater	1,495 sq. ft.
Combined heating surface	4,740 sq. ft.
Grate area	86·94 sq. ft.

The Delaware and Hudson's Laurentian, northbound at Mechanicville, N.Y., over a stretch of track in which the rails have been made continuous for approximately 2,000 ft. by welding the joints (*see editorial article on page 278*)

Grand Union Canal Developments



Aerial view of some of the 51 new locks, between Napton and Birmingham on the Warwickshire section of the Grand Union Canal. The inauguration of these by the Duke of Kent in October last completed the £1,000,000 modernisation scheme of this 280-mile waterway to which reference is made on page 285. An important feature is the use of wider locks to accommodate larger capacity and diesel-driven boats; the two widths may be seen in the picture

XUM

SCENES ON THE GERMAN RAILWAYS

The new station at Oberhausen, German State Railway. The restrained and modern lines of the building are seen to the best advantage by reason of the generous open area in front

An aerial view of the harbour and harbour station at Friedrichshafen, showing the convenient communication afforded between train and boat

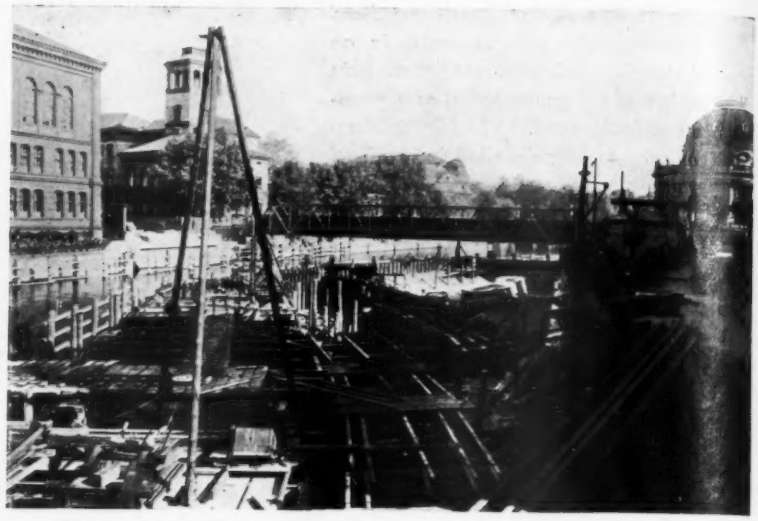
Right: The Flying Hamburger diesel railcar outside Cologne station in an impressive setting with the famous twin spires of Cologne cathedral as a prominent background. The Flying Hamburger was fully described in our diesel railway traction sections of March 25 and October 7, 1932, and in "The Railway Engineer" of March, 1933

Below: Steam railcar of the Lübeck-Büchen private railway leaving the Hauptbahnhof, Hamburg. The car went into service on May 15 last and was briefly described on page 964 of our issue of June 1

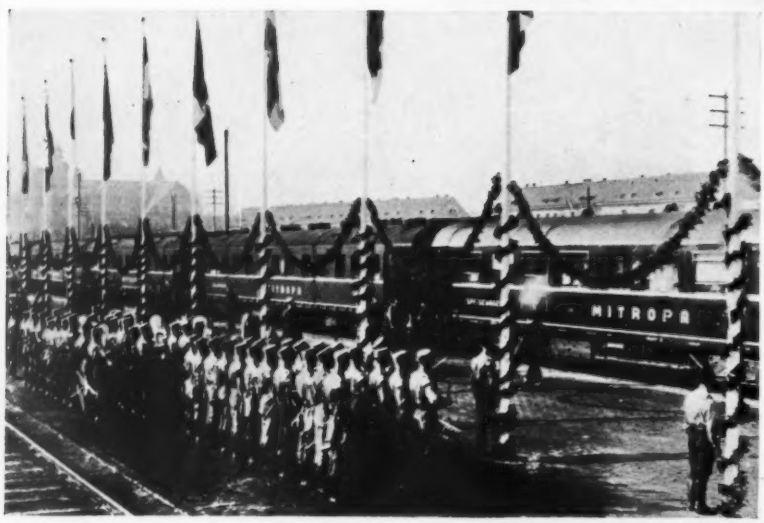
XUM

Scenes on the German Railways

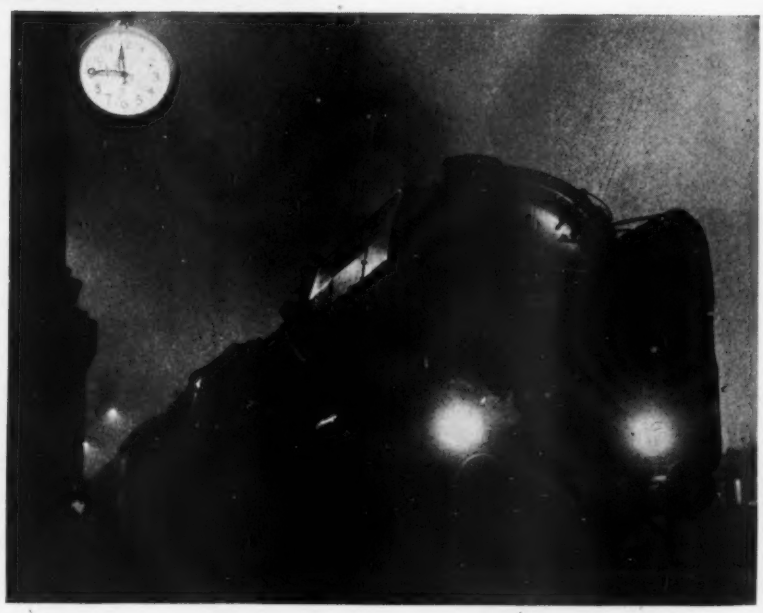
See also pictures on pages 292-3 and calendar review on page 279



Above: Constructing a tunnel to carry the new Berlin Nordsüd Stadtbahn under the River Spree. The scheme was described in our issue of August 25, 1933, and further details of progress with the work appeared in our Overseas columns of August 24, 1934



Above: Ceremonial reception at Nuremberg of the train conveying representatives to the National-Socialist demonstration in September, 1934



Right: Into the New Year! The impressive concluding illustration in the Reichsbahn calendar

RAILWAYS AND ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

Railhead Services and Licensing

WHILE the railhead scheme of collection and delivery of goods has proved so successful that the railway companies are adopting it more and more, it has given rise to difficulties in securing licences, as we have recorded several times in these pages during recent months. The tasks of the licensing authorities should be rendered easier as the result of the decision given last week by the Appeal Tribunal under the Road and Rail Traffic Act, 1933. The appeal arose out of an application by the L.N.E.R. to the Licensing Authority of the Northern Traffic area for licences for five vehicles—four of which were granted and one refused—in connection with the railhead at Loftus, which serves 14 stations within a radius of 20 miles.

In announcing the decision that the fifth licence should be granted, the Chairman, Mr. Rowand Harker, K.C., said the Tribunal had come to the conclusion that the traffic could be better co-ordinated and carried out by the railway company having the road vehicles under its control rather than that the work should be done by hired vehicles owned by other people. It would be in the interest of the public generally that this should be so as the work could be more efficiently carried out by the railway company. The evidence proved that the fifth vehicle was necessary and that over 90 per cent. of the goods carried by it had come by or been dispatched by railway.

Tunbridge Wells Area Changes

WITH the sanctioning, a few days ago, by the shareholders of Redcar Services Limited, Tunbridge Wells, of the sale of their undertaking to the Maidstone & District Motor Services Limited, the Southern Railway associate, the way is clear for the reorganisation of the railway-associated bus services in the area which has long been under consideration. The Tunbridge Wells district occupies an unusual place in the provincial bus organisation, as its pioneer operator—Autocar Services Limited—experienced severe post-war competition from Redcar and eventually entered into a sharing agreement with that company. Although the Autocar business then came under L.G.O.C. control, it was the only operating member of that group not taken over by the London Passenger Transport Board, as its activities were mainly outside the Area. The L.P.T. Act of 1933 (Section 99) made provision for the sale of such activities to the Southern Railway, and on July 1, 1933, this step was taken, the M. & D. Company immediately succeeding to control of the business via the Southern Railway. The existence of the Autocar-Redcar sharing arrangement, however, prevented any modification of services and only now is the ground clear. We understand that the M. & D. Company may probably absorb most of the Autocar and Redcar routes and transfer to Southdown Motor Services those in the sector south and west of Tunbridge Wells.

One of the sets of trucks for transporting railway vehicles on the highway in Germany being used for moving a passenger carriage. The system was described in "The Railway Gazette" of November 24, 1933

XUM

Transport Co-ordination in India

THE Transport Advisory Council, convened with the object of formulating road and rail co-ordination policy, met at New Delhi in the Princes' Chamber on January 7. The local governments were represented by their respective Ministers in charge of the local self-government departments, with advisers from the provincial public works departments. The Central Government was strongly represented on both the railway and road sides. The railway members included Sir Guthrie Russell, Chief Commissioner of Railways, and Mr. P. R. Rau, Financial Commissioner on the Railway Board.

The Chairman, Sir Frank Noyce, Member for Industries and Labour in the Viceroy's Council, in opening the proceedings, outlined the purpose of the meeting, explained the rates structure of Indian Railways, and reviewed what had been done in other parts of the world to co-ordinate road and rail transport. He said that the Government of India was not antipathetic to road interests; it hoped for days of prosperity when there would be enough movement of goods and persons to justify a network of motor transport alongside a complete system of railways, each performing the duties for which it was specially suited. The Chairman also referred to the constitutional difficulty arising from the fact that the railways were a Central subject, while the roads were local.

The Conclusions

The Transport Advisory Council reached important conclusions on the future policy of road and railway transport. These are set forth in a statement which, where it was not the unanimous voice of the Council, was adopted by a majority of more than two-thirds.

PART I.—ROAD AND RAIL CONSTRUCTION

(1) For the present, funds available for roads, other than funds required for the maintenance or fulfilment of existing commitments, should be applied to the development of roads which do not duplicate the existing means of transport.

(2) Where a metalled road runs parallel to railway feeder roads, giving access from or to that road, to or from railway stations, towns and large villages close to it, it should be constructed and maintained up to a standard which will secure that access unimpeded.

(3a) In the administration of the Road Account, any scheme for the construction or improvement of a road included in the accepted skeleton system of trunk roads should not be opposed by the Government of India merely on the ground that such a road is parallel to a railway, but a scheme for the construction or improvement of any other road parallel to a railway should require special justification with reference to the circumstances of the particular case;

(3b) The accepted skeleton of trunk roads referred to above should be settled in agreement with local governments.

PART II.—CONTROL OF TRAFFIC

(1) For the double purpose of promoting public safety and convenience and placing rail-road competition on an equal footing, the following measures should be adopted in regard to motor buses:—

(*a*) Reasonable standard of maintenance of vehicles; (*b*) medical inspection of drivers; (*c*) insurance against passenger and third-party risks; and (*d*) adequate inspection and enforcement of regulations.

(2) The number of motor buses should be restricted so as to avoid wasteful competition. In order to secure this: (*a*) motor buses or services of motor buses should be licensed for a specified route or specified routes only and (*b*) in determining whether a licence should be granted or not, regard should be had to the following four tests:—(i) the extent to which the needs of the proposed routes are already served; (ii) the extent to which the proposed service is desirable in the public interest; (iii) the traffic needs of the area as a whole, including the need to link up routes with railways or other routes; and (iv) suitability of routes for the proposed traffic.

(3) It may be expedient in order to take fuller advantage of a particular road: (*a*) to grant a monopoly of motor bus traffic for a limited period on that road to a well-organised service and (*b*) to arrange for the issue of through tickets for journeys partly by such service and partly by the railway fed by it.

PART III.—ADMINISTRATIVE MACHINERY

(*a*) The Government of India and local governments, particularly under the new Constitution, should as far as possible place in charge of a Member or Minister all matters relating to communications: (*b*) the annual meeting of the Transport Advisory Council as the advisory body for the co-ordination of road and rail transport should be continued: (*c*) each local government should create or maintain provincial boards of communications with advisory functions relating to matters concerning co-ordination of road, rail and inland water transport, in which railways and inland water transport should be adequately represented; and no important scheme of road, rail or inland waterway development should be approved by a local government before it has been discussed by the board after adequate notice has been given to the various interests concerned: (*d*) each local government should take measures to establish machinery for the control of motor transport according to the circumstances of each province, which will be adequate to carry out the detailed measures recommended by this council and accepted by the local government for the control of motor transport.

AN IMPORTANT LICENSING POINT.—A necessity for revising the regulations under the Road and Rail Traffic Act, 1933, relating to applications for licences, in order to secure definite information as to where the vehicles are to be used, is indicated by the decision of the Court of Appeal reversing the order obtained by the Great Western Railway in the Divisional Court that a licence granted to a furniture remover should be quashed. The application form stated that the vehicles were to be used in Birmingham, Wolverhampton and district and the licences were granted for the removal of furniture over any distance. The G.W.R. complained that the Licensing Authority for the West Midland Traffic Area had exceeded its jurisdiction in granting the licence in that form when the application was for the Birmingham and Wolverhampton district, and that if it had known there was a possibility of the licence being extended it would have opposed the application. The Divisional Court decided that the licence should be quashed and the licensing authority appealed. In giving the decision of the Court of Appeal, Lord Justice Greer expressed considerable sympathy with the point of view of the G.W.R., but said that while its contention might be a reasonable one, it was not one to which he could give effect on the language of the Act. He thought the words Birmingham, Wolverhampton and district meant not the district to which the licence was to be confined, but the district in which it was normally intended to use the vehicles. Lord Justices Slesser and Roche concurred. Leave was granted to appeal to the House of Lords.

WHAT IS A VEHICLE?—A knotty point had to be decided by the North-Western Traffic Authority recently when an applicant claimed that he was entitled to a licence on the ground that he was merely changing his form of transport, he having formerly carried goods by barge on the canal between Liverpool and Leeds. It was pointed out that there was no definition of "vehicle" in the Act, and it was eventually decided to grant the licence.

DRIVING LICENCES. — Notice has been issued by the Minister of Transport that Section 31 of the Road Traffic Act, 1934, is to come into force on April 1 next. This section provides that no one (unless he is licensed to drive all types of single deck vehicles) shall drive a heavy goods vehicle after the expiry of any ordinary driving licence held by him, and current at the date when the section comes into force, without a licence from the Licensing Authority of the Traffic Area in which he resides.

Handling Heavy Loads in Goods Stations

A powerful unit for lifting up to 6 tons, comprising a Ransomes and Rapier crane mounted on a six-wheeled, oil-engined Thornycroft chassis, in the service of the G.W.R.

NOW that increasing use is being made of mobile cranes for handling heavy loads in goods yards, particularly for dealing with large containers, it is of especial interest to give some details of a unit now being employed in the Paddington depot of the G.W.R. This vehicle is seen in the illustration lifting a container of a gross weight of 5½ tons. The crane is a Ransomes and Rapier unit, and the chassis a Thornycroft rigid six-wheeled, forward control, 12-ton type fitted with the maker's standard four cylinder, 82 h.p., compression ignition engine.

One of the up-to-date 6-ton mobile cranes, described above, handling a loaded container at the G.W.R. Paddington goods station

The chassis has been constructed to carry and distribute the loads imposed upon it by the crane in its various positions and special attention has been paid, in designing the rear portion, to ensuring an even distribution of weight on the four wheels as well as securing freedom from frame distortion under all conditions of driving and braking. The crane base is of rolled steel sections and plates constructed to suit the chassis and arranged to support the rack, roller path and centre post.

To avoid overloading of springs, axles and tyres, supports or jacks are fitted between the rear wheels on each side. These supports are cross-braced to the chassis frame and have their feet set at a predetermined height above the ground. With the jib over the side and picking up a maximum load the jack on that side comes down on the ground but on slewing the jib round till it is in line with the axis of the chassis the jack then comes clear of the ground and the vehicle can travel with the load at a speed of 2 m.p.h. A simple adjustment is provided to enable the jacks to be set to suit uneven ground and this operation can be carried out in 30 seconds, including the time taken by the operator to dismount from, and return to, his driving seat. It should be made clear that the jacks are not provided for stability but only to relieve loads on the axles, springs and tyres when lifting maximum loads with the jib overside. We understand that with about 25 per cent. of maximum loads with the jib overside the jacks are clear of the ground.

For travelling, the drive from the engine is through a single plate clutch and propeller shafts to the two overtype worm driven back axles. For the operation of the crane, the engine is suitably coupled to a variable speed generator, the speed being regulated by the driver, and the current generated is supplied to the particular motion required. With this type of crane it is rarely necessary to

travel when hoisting or slewing and therefore the vehicle is driven alongside the load in the usual manner and the driver turns his seat round to face the superstructure and operate the crane or he can mount the superstructure and work it from the duplicate control provided.

Designed to be fool-proof, the simple foot and hand control is somewhat similar to that of a motor vehicle. Mounted conveniently at the driver's side is a combined reversing switch box for the operation of the hoisting, slewing and derricking motions. All speed control is effected through the medium of the accelerator pedal. After the engine has been started, it runs at " ticking-over " speed, which is not sufficient to excite the dynamo. When the crane has to be used, the accelerator pedal is depressed until about 50 volts is indicated on the voltmeter; the appropriate control switch or switches can then be engaged, the particular movement commences, and subsequent acceleration is secured by still further depressing the pedal. If the crane is hoisting at full speed and it is desired to perform another motion simultaneously, the accelerator pedal should be momentarily released and the proper switch engaged when the pedal is instantly depressed again to give the required speed.

Hoisting and derricking motions are performed by separate, series-wound, totally enclosed, motors driving barrels through worm and spur reductions while the slewing motion is obtained through a motor driving the main pinion engaging with the rack through worm and spur reductions. With the exception of the slewing rack and pinion all gear wheels on the crane have machine cut teeth and are mounted upon steel shafts, the journals and bushes being of gun-metal with adequate facilities for lubrication.

The revolving portion of the crane consists of a bedplate, to which is bolted a structural steel braced frame. A substantial cross shaft at the top of the frame affords pivot mounting for the cantilever jib, which is constructed of steel sections rigidly cross-braced. The bedplate is arranged with a suitable bearing to receive the centre post and the crane revolves on coned steel rollers running on a machined steel path. Brakes for the hoisting and derricking motion are of the Lewis patent self-adjusting, solenoid type which adjust themselves to the wear of the linings without needing attention. Limit switches are fitted to prevent overwinding.

The crane will lift 6 tons at 9 ft. 6 in. radius or $1\frac{3}{4}$ tons at 16 ft. 7 in. radius, the height of lift at minimum radius is 21 ft. from ground to hook and at maximum radius 10 ft. It will hoist 6 tons at 23 ft. per minute and $2\frac{3}{4}$ tons at 45 ft. per minute. It can be slewed at $1\frac{1}{2}$ rev. per minute. Without load and with the jib central, the vehicle can travel at 20 m.p.h. and it can be turned without reversing in a road about 60 ft. wide. Its total weight is given as $18\frac{1}{2}$ tons.

Leylands for Persia

OF a fleet of nine Leyland vehicles recently supplied to the Anglo-Persian Oil Co. Ltd., for service on the company's roads in Persia, probably the most interesting are three articulated ten-wheeled 15-ton dual-purpose machines. Each comprises a six-wheeled tractor chassis and a four-wheeled trailer, mounted on the tractor by a turntable. The tractor has a Leyland 11-litre petrol engine of 150 b.h.p. governed to a maximum speed of 2,200 r.p.m. and transmitting its power to the twin rear axles through a single plate clutch, which differs little from that employed as standard on other Leyland models. Left-hand steering is employed, the tyres are 13·50 × 20 low pressure type, and the wheels are braked through Westinghouse pressure brakes, the footbrake operating on the six tractor wheels and the handbrake on the driven axles only. In addition to the usual trailer brake connection there is also a hand-operated brake at the rear of the trailer, designed for operation when negotiating difficult gradients or for use when the unit is at rest on a steep incline. The vehicles are designed for general transport work or for pipe-carrying and will operate from the Anglo-Persian base at Abadan on the Persian Gulf, and in addition to the platform body shown in our illustration, the tractors are also supplied with trailers for carrying pipes, some of them being up to 40 ft. in length. The other Leyland vehicles in this fleet are two 1,250-gallon four-wheeled tanks; one four-wheeled pipe carrier; one ten-wheeled 4,000-gallon tank and two six-wheeled tanks.

One of the ten-wheeled articulated Leyland vehicles which are being used by the Anglo-Persian Oil Co. Ltd., in Persia on pipe line work

Impressions of the Motor Coach in America

By A. W. ARTHURTON, formerly Secretary, British Railways Press Bureau

FOR almost fifty years in the early history of North America the stage coach continued as the only public travel service in the country and even after the coming of the railway, remained for a considerable time as a necessary public utility. For a few brief years in the latter part of the 19th century, the " iron horse " and the inter-urban electric tram were supreme. Highway travel was regarded as a memory of the romantic past and highway development was at a standstill. Then came the motor car, and with almost dramatic suddenness it won its way to popular favour. The well-established rail services, both steam and electric, were confronted with a new and menacing competitor. Everyone wanted to travel by road, and everyone wanted to travel on rubber. The motor vehicle began to appear in public service and rapidly grew in popularity.

During the many years the old horse-drawn stage coach was in service, it contributed little to the comfort of its hardy patrons. It was slow and clumsy and afforded no provision for heat, light or ventilation. The evolution of the motor coach has, on the other hand, been rapid and spectacular.

Judged by the standards of to-day the early motor coaches would probably be considered close relatives of the old stage coach. The bodies of some of the first models were fashioned after the open touring car with collapsible tops that afforded poor protection from the weather. With their solid rubber tyres, heavy springs and poorly designed seating accommodation, they were anything but comfortable. Then came the high pressure pneumatic tyre for motor coaches, specially constructed springs, air brakes, newly designed individual upholstered seats, spacious bodies, well-ventilated and lighted and comfortably heated in cold weather, and finally the balloon tyre and further refinements of body and chassis to ensure for the road traveller the speed, safety and comfort expected of modern public services.

Probably the most outstanding features of these new motor coaches, are absolute smoothness of operation and the absence of gearbox noise. These advantages are obtained by the use of the fluid flywheel and epicyclic transmission. The chassis is suspended on specially designed springs supplemented by heavy duty shock absorbers to ensure smooth and easy riding. Shatterproof safety glass is used and the windows are raised instead of lowered for ventilating purposes. A positive ventilation system assures an ample supply of fresh air at all times, while large hot water heaters and completely insulated walls keep the coaches warm and comfortable during the winter months.

In the last few years great motor coach and bus companies have extended their services throughout North America from coast to coast and from border to border. The Gray Coach Lines, which co-operate in some cases with the railways and are controlled in the Toronto area by the Toronto Transportation Commission, cover a large portion of Ontario and have many services in the Eastern portion of the United States. They also run a large number of sight seeing tours in Washington and other cities.

The Greyhound coaches have services right across the continent in summer and winter, and their graceful blue and white vehicles may be seen in almost every State from the Atlantic to the Pacific. This company has developed in a few short years from a short jitney bus operation into a 50,000 mile transportation system. On California's picturesque Coast-Mission Highway and north to Portland (Oregon), Greyhound Lines operate the Nitecoach sleeping coaches with comfortable chairs by day and roomy air-cushioned berths by night. These coaches, it is said, are built on an entirely new principle. The coach contains five roomy compartments each with one large double berth and three single berths. Each berth has an individual curtain and in addition a heavy sliding drape is suspended at the centre of each compartment affording complete privacy. Each compartment contains a wash basin with hot and cold running water, mirror, portable table, and special lighting features. There is

PENNSYLVANIA GREYHOUND LINES
LOS ANGELES · ST. LOUIS · CHICAGO · DETROIT · INDIANAPOLIS · CINCINNATI · CLEVELAND · PITTSBURGH · WASHINGTON · PHILADELPHIA · NEW YORK

A typical American coach of to-day ; one of those run by Pennsylvania Greyhound Lines, which is associated with the Pennsylvania Railroad. Note the observation platform at the rear

also a radio in each compartment. Light lunches are served from a well-stocked refrigerator. At the rear of the coach is a well appointed women's lounge and there are two separate toilets of new automatic type. An aisle is provided at the side and runs the entire length of the coach and ample luggage space is provided.

The motor coach has apparently permeated every corner of the United States and one has to admit that the majority of the services are efficiently run. Interstate and trans-continental services are common, and as the desire for travel increases, a greater number of people use the "motor coach way."

Road publicity is well done and a study of some of the pamphlets reveals a keen desire to cater for the comfort and convenience of their patrons. Emphasis is laid on the courtesy of the drivers not only to their passengers, but also to other users of the road. Attractive rewards—in many cases additional pay—are given to drivers who maintain clean safety records for months and years—without even a minor accident.

The motor coach industry in America has become in recent years a force to be reckoned with in the world of transport. It provides a necessary service which in many cases could be performed by no other system.

Road Competition in Spain

A decree published on January 1 authorises the Railway Companies' Association and the Road Transport Board to submit to the Ministry of Finance for confirmation, nominations of inspectors, whose duty it will be to enforce the payment of taxes under the road transport laws. The decree specially charges the inspectors with the detection and reporting of frauds in connection with the motor car registration fee and the transport tax. This measure is possibly the outcome of the repeated complaints made by the railway companies and regular road services, of the large number of pirate vehicles running on the roads, which, although competing with the railways and other regular services, do not pay their fair share of taxation.

A Go-Anywhere Vehicle

The illustration below is of one of a batch of medium-capacity six-wheeled freighters of the FM6 type recently built by Karrier Motors Successors Limited, to a War Office order, undergoing tests on the Pennine Moors, above Huddersfield. These vehicles are somewhat similar to those ordered some little time ago by the Indian Government and now giving good service on the North-West frontier. The FM6 chassis carries a net load of 3 tons across rough country, or 5 tons over highways. A range of eight forward and two reverse speeds enables it to negotiate rough tracks, loose surfaces and severe gradients, while good speeds can be maintained on made roads. By employing chain tracks on the rear wheels soft sand and boggy ground can be traversed. The power unit is the Karrier 41-68 h.p. type; low pressure tyres (9·00 × 22·0) are fitted, and bodywork up to 16 ft. in length can be accommodated. There are two sets of brakes; one, foot-applied and servo-assisted, operates on the rearmost axle, the other, hand-applied, works on the forward driven axle.

Road Services and the King's Jubilee

The various area traffic commissioners have given notice that, in view of the public need for additional travelling facilities on the occasion of the Bank holiday on May 6, proclaimed in celebration of His Majesty's Jubilee, they propose to dispense, under the provisions of Section 72 (10) of the Road Traffic Act, 1930, with the conditions attached to *all* road service licences to the extent necessary to enable licensees to operate on that day any services which, under their licences, they would be entitled to operate on August bank holiday Monday. This concession is subject to the conditions applicable to that bank holiday, except that the fares chargeable shall be those authorised for services operated on May 6, where such fares differ from those authorised for similar services operated on the August bank holiday. Any services additional to these must be applied for in the normal way, and at as early a date as possible.

A. E. C. Rangers for Canada

With reference to the A.E.C. vehicles supplied to the British Columbia Electric Railway Company of Vancouver and to the Ottawa Electric Railway Company, which were described in our issue of January 18, it should be made clear that the chassis in each case was the A.E.C. Ranger type as mentioned in the article. The references to Regent in the title and in the text were in error, the Regent being a double-deck chassis primarily designed for service in this country.

An interesting vehicle of the Karrier FM6 type, recently supplied to the War Office. Lorries of similar type have been supplied to the Indian Government for service on the North-west frontier

RESERVED SEAT INDICATION AT EUSTON

LAST summer the L.M.S.R. reorganised its arrangements at Euston for reserved seat booking and identification in such a way as to offer passengers the maximum service and greatest simplicity of detail at a busy terminus during the peak period. Brief reference to this was made on page 594 of our issue of April 6, 1934. From the public point of view the chief change was the introduction of a new and distinctive type of coach identification label—black lettering on yellow ground—and a system of similar coloured wooden plaques bearing letters and numbers corresponding with the appropriate coach identification labels. The latter are suspended from wires parallel to the trains, as shown in the illustration alongside; these wires are fitted along all the principal departure platforms at Euston, namely, Nos. 6, 12, 13, 14, and 15.

The seat booking organisation is provided with train charts showing the formation of each train, including any extra vehicles which may be requisitioned to deal with pressure of bookings. All coaches, except dining and sleeping cars, carry an index letter and number. If a train is of a composite nature with vehicles for two or more destinations each portion carries a different index letter, and as many numbers as may be requisite. For example, the Royal Scot Glasgow portion is marked A.1, A.2, and so forth; Edinburgh B.1, B.2; and Aberdeen C.1, C.2. The coach identification letters are fixed by the seat reservation attendant when he is effecting reservations in the empty stock at carriage sheds and are arranged to agree with the train chart from which he is working. Upon the arrival of the empty stock at the platform, the seat reservation attendant fixes by means of a hod the wooden plaques, taking them from a special platform trolley as required. The plaques have given great satisfaction, as the numbers may be seen by passengers as soon as they reach the platform.

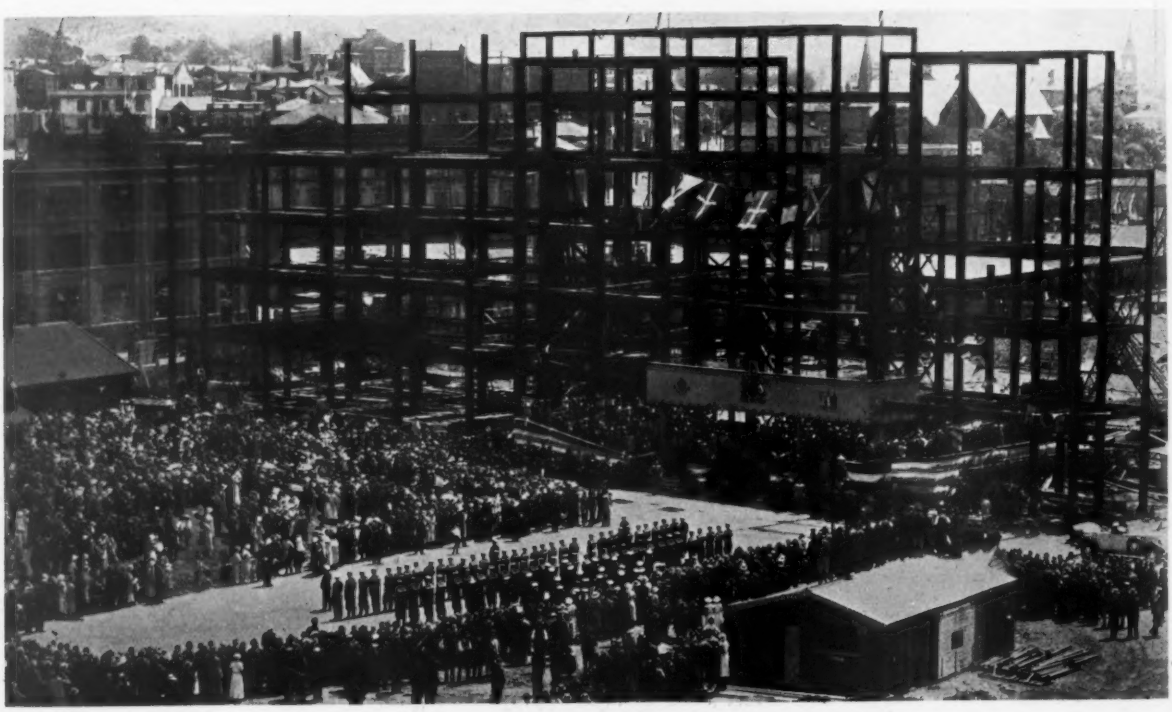
Hanging coach identification plaques on wires alongside main line trains at Euston

General view of main line departure platforms 12 *and* 13 *at Euston, L.M.S.R., with trains bearing coach identification labels and appropriate plaques alongside*

Left: Monsignor V.B. Jasinski, Bishop of Sandomierz, taking part in the inauguration ceremony of the recently-opened new railway between Cracow and Miechow in Poland

Right: A steam-operated light railway leaving its station in Milan, which is situated in the courtyard of a house in the busy thoroughfare Corso Vercelli *(see paragraph on page 310)*

Below: H.R.H. the Duke of Gloucester laying the foundation stone of the new station at Wellington, New Zealand, on December 17 last. *(See page 1019 of our December 21 issue)*



RAILWAY NEWS SECTION

PERSONAL

The King has approved of the appointment of Sir Josiah Stamp, G.C.B., G.B.E., D.Sc., Chairman and President of the Executive, L.M.S.R., to be a Member of the Council of the Duchy of Lancaster.

INSTITUTE OF TRANSPORT

The following corporate members and associate members have been elected, and non-corporate associates, graduates, and students admitted during January :—

Members

Mr. Henry Chapman, C.B.E., Resident Director and General Manager, Rhodesia Railways.

Mr. Dudley Lemon, Research Officer, Port of London Authority.

Mr. Gordon Paget Stuart-Clark, Divisional Superintendent, Omnibuses (Central), London Passenger Transport Board.

Associate Member

Mr. John McClelland, L.M.S.R.

Associate

Mr. H. H. Andrews, English Electric Co. Ltd. (Traction).

Graduates

Messrs. R. J. W. Bone and D. B. Manning, L.N.E.R.; J. A. De Wet, J. Kruger, P. J. Van Der Merwe and A. W. Van Wezel, South African Railways and Harbours; R. D. H. Jones, G.W.R.; R. E. Sinfield and A. J. Warren, Southern Railway.

Students

Messrs. T. Allen, A. Bostock and J. G. C. Milligan, L.N.E.R.; D. W. M. Fox and F. J. Ivimey, S.R.; E. L. Jones, L. King, E. Lissenden and G. W. Williams, G.W.R.; J. F. Oldknow, L.M.S.R.; A. E. Osborne, Carter, Paterson & Co. Ltd.

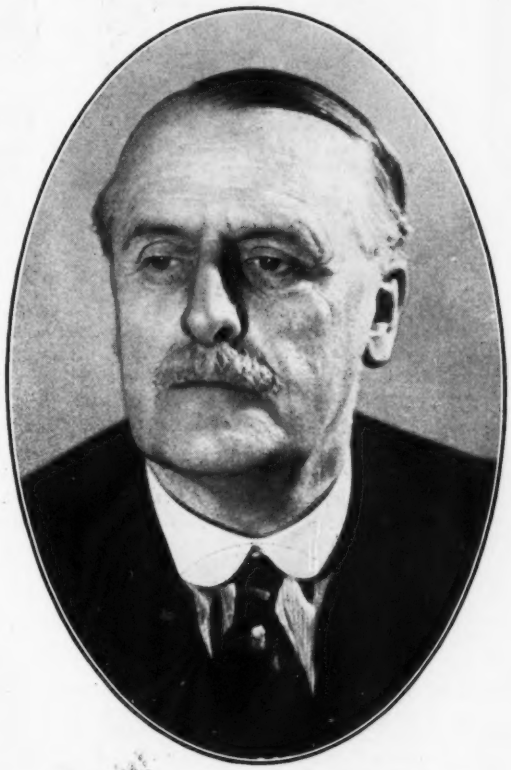
The Secretary of State for the Colonies has recently made the following appointments:—

Mr. C. E. Rooke, General Manager, Cyprus Government Railway, to be Traffic Manager, Tanganyika Government Railways.

Mr. A. A. G. Fisher to be Chief Storekeeper, Tanganyika Government Railways.

We regret to record the death, on February 9, of Sir Henry Lambert, K.C.M.G., C.B., Senior Crown Agent for the Colonies until his retirement in 1932. Sir Henry was born in 1868, and educated at Eton and New College, Oxford, where he took a first class in *Lit. Hum.* He passed into the Civil Service in 1892 and entered the Colonial Office, becoming Assistant Under-Secretary of State in 1916. He was created a K.C.M.G. and appointed Senior Crown Agent prior to reverting to the Colonial Office as Acting Under Secretary in 1924. After a few months, however, he returned to the Crown Agency and remained there until his retirement.

Mr. Robert M. Holland-Martin, C.B., F.S.A., who, as briefly announced in THE RAILWAY GAZETTE of January 4, last, has been elected Chairman of the Southern Railway as from January 1, 1935, joined the Board of the London & South Western Railway Company in December, 1910, and became Deputy Chairman of the Southern Railway on May 26, 1932.



Mr. Robert M. Holland-Martin, C.B., F.S.A.,
Chairman of the Southern Railway Company

Born on October 10, 1872, he is the son of the Rev. Frederick Whitmore Holland, and Penelope, daughter of Robert Martin, of Overbury Court, Tewkesbury, and was educated at Eton and Trinity College, Oxford. In 1911 he was created C.B., and took the surname of Martin in addition to that of Holland by Royal licence dated August 14, 1917. He was Chairman of the County of London Territorial Army and Air Force Association from 1925 to 1932, and recently resigned from the Honorary Secretaryship of the Bankers' Clearing House, after 25 years' service. Mr. Holland-Martin is a member of all Standing Committees of the Southern Railway, and in addition is the company's representative on the East London Railway Joint Committee, the Railway Companies' Association, and the West London Extension Railway; he is also a member of the L.B.S.C.R. Pension Fund. Amongst his other directorates are those of Martin's Bank Limited and of the Gas Light & Coke Company.

Sir Arthur Fell, late President of the House of Commons Channel Tunnel Committee, left estate valued at £121,258 (£111,371 net.)

Mr. P. C. Saccaggio, Technical Adviser to the General Manager of the B.A. Great Southern Railway, has returned to Buenos Aires from Europe.

Mr. A. H. Roberts, Traffic Superintendent, and Mr. W. J. Hutchinson, Resident Engineer of the Leopoldina Railway returned to Rio on January 14 from leave in England.

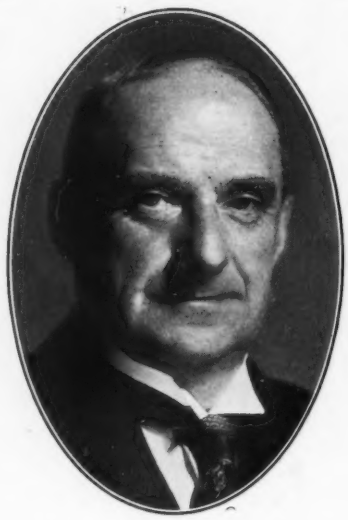
At the funeral of Sir Herbert Gibson, Bt., there were among those present:—

Messrs. Ronald Leslie (General Manager, Central Argentine), C. A. Roberts (General Manager, B.A. Western), J. M. Eddy (Director of the B.A.G.S., B.A. Western, &c.), Sir G. E. Leguizamon (Chairman of the Local Committees of the B.A.G.S. and B.A. Western), Mr. Calder Angel (Member of Local Committee, B. A. Western), Sir Henry Chilton (British Minister in Argentina), representatives of other railways and the local railway committees, of commercial interests, and of various Government bodies.

One of the funeral orations was read by Sir Guillermo Leguizamon, K.B.E.

Sir Guillermo E. Leguizamon, K.B.E., Vice-Chairman of the Local Board, Buenos Ayres Great Southern Railway, has been appointed Chairman in succession to the late Sir Herbert Gibson. Dr. Leguizamon was born in Argentina in 1878, and educated at the National College of Catamarca and Buenos Aires University, where he graduated as Doctor of Law in 1900 and Doctor of Philosophy and Letters in 1901. From 1896 to 1899 he was on the editorial staff of *El Tiempo*, from 1902 to 1912 he was Professor of Literature in Sarmiento National College, and from 1912 to 1922 Deputy-Professor and for four years acting Professor of Roman Civil Law in Buenos Aires University. In 1905 he joined the Legal Department of the B.A. Western Railway and was appointed Chief Local Lawyer in 1913. He became a Member of the Local Board in 1915, and Chairman in 1928. In 1933 he was elected Vice-Chairman of the Local Board, B.A. Great Southern Railway. Dr. Leguizamon

Sir Guillermo E. Leguizamon, K.B.E.,
Appointed Chairman, Local Board, Buenos Ayres Great Southern Railway



Mr. T. W. Royle, M.B.E.,
Appointed Chief Assistant Commercial Manager, L.M.S.R.

Mr. C. Phizackerley,
Appointed Assistant (Freight Services) Operating Department, L.M.S.R.

was a Delegate and Secretary of the First South American Railway Congress, held at Buenos Aires in 1910, and since the second Congress, held at Rio de Janeiro in 1922, he has been a Member of the Permanent Committee. He was, moreover, Chairman of the Committee on National Grain Elevators, Member of the Honorary Financial Advisory Committee to the Government in 1932 and Minister-Plenipotentiary with the Roca Mission to Great Britain in 1933, when he was created an Honorary K.B.E.

Chief Assistant Commercial Manager L.M.S.R., entered the service of the Lancashire & Yorkshire Railway in 1898 and was employed in the Passenger office, subsequently being transferred to the personal staff of the Passenger Superintendent. In October, 1914, he was appointed Confidential Assistant to the then Superintendent of the Line, Mr. Arthur Watson, in connection with the Railway Executive Committee. Mr. Royle was created a Member of the Order of the British Empire in January, 1918, for services rendered during the war. He was appointed Assistant Superintendent of the Line, Lancashire & Yorkshire Railway, in February, 1919, and two years later, at the time of the amalgamation of the L. & Y. with the L.N.W.R., he became Assistant Divisional General Superintendent, Northern Division, L.N.W.R. Then when the L.M.S.R. was formed in 1923, Mr. Royle was designated Assistant General Superintendent (Western Division) L.M.S.R., and in the following year became Divisional Superintendent, Manchester. His title from 1929 until October, 1932, was Divisional Superintendent of Operation, Manchester. Since the latter date he has been Assistant Chief Commercial Manager of the whole system, the post from which he has now been promoted to be Chief Assistant Commercial Manager.

Mr. C. N. Mansfield,
Appointed Assistant Chief Commercial Manager (Coal), L.M.S.R.

Elliott] [& Fry

Mr. S. E. Parkhouse,
Appointed Divisional Superintendent of Operation, Crewe, L.M.S.R.

Mr. H. E. Morgan,
President of the Institution of Railway Signal Engineers, 1935-36

Mr. T. W. Royle. M.B.E., who, as announced in THE RAILWAY GAZETTE of February 8, has been appointed

Mr. C. Phizackerley, who, as announced in THE RAILWAY GAZETTE of February 8, has been appointed Assistant (Freight Services), Operating Department, Euston, L.M.S.R., joined the former London & North Western Railway as a probationer. After a period of training he was appointed Assistant to the District Superintendent at Shrewsbury in March, 1912. When that district was disbanded he became Assistant to the District Superintendent, Liverpool, in March, 1915. In March, 1919, Mr. Phizackerley was promoted to be Assistant District Superintendent, Swansea, and in October, 1929, became District Controller, Liverpool, L.M.S.R. Just a year later he was transferred to Crewe as Divisional Controller (Passenger Services), and in November, 1932, he was appointed Assistant Divisional Superintendent of Operation at Crewe, the position he now vacates to go to Euston as Assistant (Freight Services).

Mr. C. N. Mansfield, who, as announced in our issue of February 8, has been appointed Assistant Chief Commercial Manager (Coal) L.M.S.R., joined the Mineral Manager's Department of the former Midland Railway at Derby in 1900. In 1909 he was transferred to Leeds as Assistant Mineral Agent and District Inspector, and three years later he was appointed District Mineral Agent, Manchester. Mr. Mansfield joined the army in 1915 and saw service in Salonika and Turkey: he was demobilised in June, 1920, with the rank of Major, then returning to Manchester. In June, 1921, he became London representative of the Mineral Manager and, following the amalgamation in 1923, was designated Mineral Agent for the London District of the L.M.S.R. It was in June, 1926, that Mr. Mansfield was promoted to be Assistant Mineral Manager, the post he now relinquishes to become Assistant Chief Commercial Manager (Coal).

Mr. S. E. Parkhouse, Assistant (Freight Services) to the Chief Operating Manager, L.M.S.R., who, as announced in THE RAILWAY GAZETTE of February 8, has been appointed Divisional Superintendent of Operation at Crewe, L.M.S.R., entered the service of the former L.N.W.R. in 1906. After gaining experience in the Commercial and Operating Departments, he was appointed Assistant to the District Superintendent at Euston in January, 1914. He saw service during the war in the Railway Operating Department, Royal Engineers, British Salonika Force, attaining the rank of Lieutenant-Colonel, and on return, became Outdoor Assistant to the Superintendent of the Line, with Headquarters at Crewe. In February, 1921, Mr. Parkhouse was transferred to Liverpool, as Assistant to the District Superintendent, and, subsequent to the amalgamation in 1923, he was successively District Controller at Liverpool, Birmingham and Willesden, and Assistant to the Divisional Superintendent of Operation at Crewe prior to being appointed Assistant (Freight Services) to the Chief Operating Manager in November, 1932. He now relinquishes the duties of the latter post to return to Crewe as Divisional Superintendent.

The new President of the Institution of Railway Signal Engineers, who took office at the annual meeting on Wednesday (see page 307), is Mr. Herbert Edward Morgan, the Western Divisional Signal and Telegraph Engineer, L.M.S.R. Mr. Morgan started his railway career in 1896 in the signal shops of the Taff Vale Railway, where he remained until 1902. He then had three years indoor and outdoor experience on the staff of the signal section of the Westinghouse Brake Company, followed by six years with the W. R. Sykes Interlocking Signal Company where, incidentally, he was resident engineer on the electro-mechanical signalling at Victoria, L.B. & S.C. Mr. Morgan joined the Midland Railway in 1911 and passed to the London Midland & Scottish when that system was formed in 1923. When with the former company, he was successively, District Inspector, Assistant to Chief Inspector, Chief Inspector (1913-1922) and Chief Assistant Signal Superintendent. On the retirement of Mr. W. C. Acfield in 1927, Mr. Morgan was made Acting Signal Superintendent for the Midland Division L.M.S.R. and was appointed to his present position in 1929. From 1916 to demobilisation in 1919, Mr. Morgan served in the Army, with the rank of Captain, most of the time in the Railway Construction and Signal and Interlocking Companies, R.E., and, after convalescence from severe injuries received in September, 1917, he was in charge of the Signalling School at Longmoor until demobilisation.

It is with regret that we have to announce the death, on February 7, of Mr. John Parry Monkhouse, who retired from the position of Mineral Traffic Manager, G.W.R., on November 19, 1927. Mr. Monkhouse, who was born in 1864, joined the Great Western in the Chief Goods Manager's office in 1880, and. apart from the period 1899 to 1904, when he was transferred to the General Manager's office, his whole service has been connected with the Chief Goods Manager's office. During the war he was, as chief of the Working Department, closely associated with the movement of munitions, guns, and other army and naval requirements, being a member of the Co-ordination Committee of the War Office and railway companies. Mr. Monkhouse was also a representative of the railways on the Home Trade Transport Committee of the Ministry of Shipping, and for his valued services in these posts he was awarded the O.B.E. In 1920 he was appointed Mineral Traffic Manager, the post he held until his retirement and filled with distinction during a time of especial difficulty. After nearly half a century at Paddington it was inevitable that he should be one of the most familiar of its figures, and a wide circle of friends will learn with sorrow of his passing.

The funeral service was held at St. Stephen's Church, Ealing, on February 9. Among those present, in addition to the family and principal mourners, were :—

Messrs. A. Maynard (Chief Goods Manager), H. W. Payne (Principal Assistant to Chief Goods Manager), C. Furber (Mineral Traffic Manager) and many other former G.W.R. colleagues.

Mr. Eric A. Robinson, A.M.I.Mech.E., has been appointed Managing Director of the Superheater Co. Ltd., London and Manchester.

Mr. Guy Nicholson has joined the board of the Sheepbridge Stokes Centrifugal Castings Co. Ltd., and he and Mr. G. C. M. Jackson have also been appointed Joint Managing Directors of the Sheepbridge Coal & Iron Co. Ltd.

Mr. F. R. Davenport has been appointed Deputy Member of the Appeal Tribunal, which operates under Section 15 of the Road and Rail Act, 1933, and deals with appeals from the area traffic commissioners as to the granting of licences for goods vehicles.

We regret to learn of the recent death of Professor G. Bognetti, for many years President of the Italian Touring Club. Tourism owes him much and he was responsible for the club's very fine guide books of Italy with their remarkable wealth of information and particularly good maps. He is succeeded as President of the club, by Senator C. Bonardi, formerly Vice-President.

RETIRED RAILWAY OFFICERS' SOCIETY

Mr. William Frank Pettigrew, M.Inst.C.E., M.I.Mech.E., has been elected President for the year 1935.

The following officers of the Society have been re-elected for the current year :—

Hon. Treasurer : Mr. J. Procter Smith.
Hon. Auditors : Messrs. A. E. Dolden and F. B. Mortimore.
Hon. Secretary : Mr. W. A. Thomas.

Reference to the activities of the Retired Railway Officers' Society is made in a paragraph on page 287.

Mr. Jacques Abady, of the Middle Temple, a well-known practitioner before the Railway Rates Tribunal, has been appointed to be of His Majesty's Counsel.

From the *London Gazette* of February 12 :—Engineer and Railway Staff Corps—Lt. Col. J. Calder resigns his commission and retains his rank with permission to wear the prescribed uniform (February 13, 1935).

Sir Robert McAlpine, first Bt., founder and head of the firm of Sir Robert McAlpine and Sons, left estate valued at £205,794, with net personalty £194,239.

XUM

Goods Shed Operations

Approximately 50 million tons of freight are handled annually in the goods terminals of the four group railways, and some 30 million tons are carted. These operations involve £5 million in station working wages and £6 million of cartage costs. The foregoing figures were quoted by Mr. E. Falconer (Goods Terminal Superintendent, L.M.S.R.), in a paper on Goods Shed Operations, read to the Institute of Transport last Monday, in order to emphasise the magnitude of the work and the importance of subjecting it to scientific investigation in these days of necessary economy. They covered wages only, and the annual costs of running the machinery and providing fuel, light, water and similar services might easily add another 1s. a ton to the cost of handling traffic.

Although the layout of goods sheds varied enormously, and seemed in some cases to have been dictated by the desire to acquire facilities at a low capital cost rather than with a view to cheapness of working, Mr. Falconer classified them under three main headings. The average type in the smaller towns consisted of a one-floor shed with limited wagon accommodation and decks of a width which permitted them to be used for storage as well as for the handling of goods in transit. Two classes of accommodation were found in larger towns. Sheds with long, narrow island decks, in which capstans or traversers were used to bring wagons as near as possible to the most convenient points for discharge or loading, gave a comparatively short barrow run for inward traffic but often suffered from a deficiency in stand wagon capacity which hindered outwards working. In the other, or "grid," type, a number of decks serving the stand wagon roads were connected together by a front deck between which and the wagons all goods had to be barrowed. In this class of shed, the restriction of dray berths to the front deck frequently led to congestion.

Calculating Performance Standards

A weakness in the existing methods of checking goods terminal expenditure was that they frequently accepted as a basis of comparison performances achieved under present conditions, from which unproductive time and other disabilities were often inseparable. In view of the high ratio of terminal costs to carriage charges and the present financial situation of the railways, it seemed desirable to seek standards of operation representing the most efficient handling of goods possible with modern equipment and experience.

With goods terminal facilities varying as they do, it was impossible to fix standards of over-all working results which would be generally applicable. The component parts of many operations were, however, common to the majority of stations, and from their analysis, standards of performance could be deduced to which individual depots might be expected to adhere. For instance, although methods of handling inward traffic were far from uniform, the operations of unloading from wagons, barrowing, and loading on to drays differed little from place to place in the work involved. Although the distance to be barrowed was variable, the average pace of barrowmen was fairly uniform, and so standard performance figures could be worked out for any station.

From these studies it would probably be found that the actual over-all output at a shed was considerably below that indicated as possible by analysis of individual operations, suggesting the need for a scientific reorganisation of staff and work. The factor offering the greatest complications in computing standards was the "peaking" of traffic, both inwards and outwards. The staff required at peak periods was frequently superfluous at other parts of the day and the most difficult problem to be solved was that of providing the men with essential employment, either in the sheds or elsewhere, so that their time should be economically filled. Detailed analysis of the work of handling gangs at different periods would reveal the times which tended to reduce over-all efficiency.

Barrowing and Cartage

Experiments in arriving at work standards had shown the importance of giving good pay loads to the barrowmen, and the relation between this and methods of unloading. If a barrowman was not receiving full loads at each journey, the length of time he took to shift his consignments might result in another being detailed to assist him, so that two men were employed on a task which one could accomplish under efficient conditions. Ignorance of the contents of a wagon on the part of the unloader was a frequent cause of barrowmen being sent away before they had received all the packages destined for a single loading point. It might therefore be advantageous for invoices to be available at the wagon-side. A more serious obstacle to the conveyance of paying barrow loads was a large number of dray berths. This could be minimised by arranging for barrowmen to convey traffic to groups of drays instead of to individual vehicles.

As in barrowing, the provision of full dray loads was the factor which governed efficiency of cartage. Since the volume of traffic passing to and from different parts of a town varied throughout the day, fixed delivery areas involved periods during which the drays were underloaded. But if dray areas were flexible, and the vehicles grouped at the shed decks as already suggested, full loads could be maintained for each dray by varying the rounds to suit the destinations of the traffic offering.

The difficulties of applying performance standards to existing sheds, on account of inadequate arrangements and the conservatism of the staff, made it necessary to consider the evolution of standard layouts and the conversion of depots thereto. A goods station where 45 men were working 1·5 hr. a ton might have its pace of work accelerated to 1 hr. a ton, with a saving of 15 men and approximately £2,000 a year. This would amply justify spending £5,000 or even £10,000 on structural alterations. These might profitably be directed towards minimising the "peak" problem by permitting rush-hour traffic to be handled by a staff which would not be found superfluous at slack periods. For example, at small stations barrowing could be eliminated and handling staff reduced by arranging stand wagon room for each destination, with a road alongside from which drays could load their town collections direct into the trucks, the draymen themselves assisting in this work. With modifications, the same plan could be adapted to larger stations. Barrowing of inward traffic could be minimised by unloading goods over narrow decks into dray berths alongside, arranged so as to have the most heavily loading drays as near as possible to the best unloading points. Unloading should not extend along the whole deck, but be confined as far as possible to areas alongside the larger drays. Wagons should be continually brought forward to these points by capstan. At small and medium stations, inward barrowing could be eliminated by conveying goods from wagons to town drays on conveying drays specially designed for this purpose.

In conclusion Mr. Falconer showed a plan of a goods station layout designed to meet the requirements he had mentioned and embodying in one shed the best available ideas apart from mechanisation. The arrangements included six island decks connected by overhead cranes at each end, and a traverser joining all rails at the front of the shed. Five movable trucking bridges were shown connecting the various decks. Under normal conditions, Mr. Falconer claimed that an over-all rate of not more than 1·2 hr. a ton could be achieved with the arrangements he described.

Mechanis ation

Discussing conveyors, he criticised the continuous type running past all loading points on the grounds that men would have to be continually in attendance to take off the packages, and as the flow of these would fluctuate, a proportion of their time would be spent uneconomically. He did consider, however, that there was great scope for some degree of mechanisation in handling miscellaneous traffic at the

larger sheds. Meanwhile, he suggested that much more attention might advantageously be paid to the education of all concerned in the running of goods sheds in order to inculcate a grasp of the principles governing the proper management of their work.

The Discussion

Mr. William Whitelaw (Chairman, L.N.E.R.), who presided in the absence of Mr. Sidney E. Garcke, moved a vote of thanks to Mr. Falconer, and initiated the discussion on his paper. He stressed the importance of investigating goods shed operations on account of the large sums of money involved, but added that the effect of swifter and more efficient work in this respect would be wasted if it resulted in trains being ready to go on the line before there were paths for them. The operating department was therefore concerned in the matter as well.

Mr. Roger T. Smith expressed his doubts regarding the possibilities of standardisation—a word which was becoming almost a slogan. Referring to mechanical aids for barrow men, he said that the disadvantage of the jib crane was that the wagon and the load had to be brought to it, which was often very inconvenient. Before the G.W.R. goods station at Cardiff was replanned, the jib cranes there worked 24 hr. a day, but, although of the overhead travelling type, they handled only 5 per cent., and sometimes less, of the traffic moved on the platforms. Conveyors were not sufficiently flexible to cope with the diversified traffic of a goods station, but Mr. Smith thought the use of mechanical trucks would be extended.

Mr. C. R. Byrom (Chief Operating Manager, L.M.S.R.) did not agree that standardisation was impossible, and pointed out that on the L.M.S.R. definite time limits had been worked out and applied for certain operations, such as unloading from wagon to deck. It was important to increase loads not only on the barrows, but on the town drays. The barrow run must be cut down and, where possible, eliminated. This had already been done to a great extent with forwarded traffic at large stations. Mr. Byrom insisted upon the importance of education. Old methods were deeply ingrained, and it was very necessary to impress upon the staff that innovations were designed to make the work easier for them. The relation between goods station working and cartage was another point to be stressed. The number of dray rounds should be reduced and, wherever possible, duplicate drays for the same round cut out, from which better dray loads would result automatically.

Mr. E. J. H. Lemon (Vice-President, Railway Traffic Operating and Commercial Section, L.M.S.R.), criticised the use of mechanical platform trucks on the grounds of cost. One hundred per cent. of the wages cost at a goods station was tied up in cranes, conveyors and the like. To rectify this, layouts should be altered so that, instead of having a dozen cranes, wagons could be brought to a single crane. The goods station question had never been properly investigated in the past because conditions were not pressing, but today railways were suffering because their terminal costs hindered them in the fight with road competitors. Apart from these expenses, railways were still the cheapest form of transport.

Mr. A. E. Hammett (Assistant for Road Transport, Southern Railway) pointed out that goods consignments were now of a far more miscellaneous character than before. He knew a shed in London built in pre-war days to handle 100 tons a night which was now called upon to deal with 1,200 tons. Before the war, some consignments could be dealt with in the yard, but now they were smaller in volume but in larger numbers, and were passing through the main down sheds. He advocated asphalt covered platforms and barrows with ball-bearings to cut down wages cost by increasing the output of the men. He believed in generous bonuses as an incentive to speeding up the work.

Mr. J. S. Nicholl said that it appeared to him that the occurrence of peak periods caused the greatest difficulties in goods shed working, and suggested the introduction of preferential rates for traffic sent on the understanding that it would be handled outside these times. He added that the question of handling costs was one which would have to be kept very clearly in mind when it came to tackling the question of dividing the functions of rail and road.

Replying briefly to the speakers, Mr. Falconer discounted Mr. Whitelaw's suggestion that goods shed work might outstrip the timetable and said that this had never been the difficulty on the L.M.S., where they wanted to speed it up in order to meet the early departure of trains. Everything possible was being done to help the men and to encourage them by means of bonus schemes. A better output per man had been secured and individual staff reduced. If anything could be done by any means whatever to ease the acuteness of peak periods, he considered that it would unquestionably have the effect of reducing costs of goods shed operation.

The Institution of Railway Signal Engineers

The annual meeting of the above was held on Wednesday evening last, February 13. The retiring President, Mr. R. S. Griffiths, was in the chair at the opening of the proceedings. The report showed that there had been a loss of 46 in the membership—five by death—but as there had been 34 new members, the decrease was only twelve, partly accounted for, the report observes, by retirements on the railways. The total membership on January 1, 1935, was 841, of which 245 were from overseas.

The financial statement showed that the year opened with a credit balance of £279 and, although £100 of 3½ per cent. Conversion Loan was purchased there remained on December 31 a balance of cash at the bank of £257. After the report had been adopted, Mr. Griffiths presented the awards for the first and second students' prize essays to Messrs. B. S. S. Tinley Simpson and A. J. Gillis respectively, and those for the best papers read during the year. Of the latter, the first went to Mr. S. W. Spendlove and the second to Major L. H. Peter.

The meeting then proceeded to the election of officers; Mr. H. E. Morgan is the President, Mr. W. S. Roberts the Vice-President, Mr. T. S. Lascelles the Hon. Treasurer and Mr. M. G. Tweedie the Hon. Secretary. Mr. Lascelles succeeds Mr. Wallis as Hon. Treasurer, who, as recorded in our issue of November 9, has had to retire owing to ill-health.

The Council is as follows:—

Messrs. J. Boot, F. L. Castle, G. H. Crook, H. H. Dyer, E. W. Hallam, C. H. Hills, C. M. Jacobs, W. R. Jones, A. Oldham, P. Lomas, H. W. Moore, R. Falshaw Morkill, A. Moss, H. F. D. Page, H. M. Proud, and F. W. Reed.

Messrs. L. J. M. Knotts and F. Edwards were elected the Honorary Auditors.

The new President, having been installed in the chair, gave the Presidential Address, and dealt with the efforts made to secure uniformity in (*a*) principles, (*b*) practice and (*c*) design in signalling. Dealing with design, Mr. Morgan said that, in 1919, the Railway Executive Committee made a proposal for the standardisation of railway equipment, permanent way track and signalling. This was remitted to a committee appointed by the general managers of the railways in 1922, which was re-constituted in 1929. The committee's final report was issued in 1931. Recommendations in regard to automatic signalling were confined to observations upon the advantages to be obtained by its use in suitable cases. They drew attention to the suitability of the modern form of multiple-aspect colour-light signalling for lines carrying intensified services, and to the two-aspect type for use as intermediate section signals for enabling existing manual posts to be closed, or long blocks to be divided.

A sub-committee was also formed of locomotive engineers, operating superintendents, and the standardisation sub-committee, to consider the troubles due to sanding. The results of their deliberations were published in the

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report and disclosed very careful investigation, not only in this country but, thanks to the assistance of Mr. C. E. R. Sherrington, of the Railway Research Service, in all parts of the world. Experiments were afterwards made on the London Midland & Scottish Railway with locomotives fitted with desanding devices, and the results were most encouraging. The committee stressed the seriousness of sanding as an obstacle to future progress in track circuit, and as causing possible abandonment of important signalling schemes, and they suggested that such a position should not be accepted without vigorous effort to overcome what was, and still is, a real disability.

Another body which had rendered valuable help in standardising detail was the British Standards Institution. The composition of its various committees was perhaps more suitable in every way, consisting as they did of representatives nominated by the railway companies, manufacturers, consulting engineers for foreign railways, the Crown Agents for the Colonies, and the Institution of Railway Signal Engineers.

Tribute must be paid to those members of the institution who were serving on the British Standards Committees. The institution was also represented upon the National Illumination Committee of Great Britain. In addition to this, the British Standards Institution had just commenced upon mechanical signalling apparatus. Before any standard was published the draft was submitted to the institution for suggestions or approval, and it had to be agreed that this was probably the best contribution they could make concerning the design of purchasable apparatus.

Mention must be made of the paper on "Railway colour light signalling in relation to manual block and multiple aspect signals" read by Mr. Bound in 1932. It set out in plain language the anomalies, inconsistencies, and shortcomings of all the different colour light installations in use, criticising the report of the Institution's Three-Position Signal Committee, and giving some valuable constructive opinions. The irony of it was that the author of the paper was Chairman of the committee in question, a fact which did at least indicate that he was not afraid to change his opinions and to give full expression to them.

There was a reason for thinking that the institution should take the task of standardisation in hand, in preference to the railway companies themselves. It was because they had the valuable assistance of contractor members and traffic associates, and also because the institution was representative of world-wide opinion. A certain amount of investigation and testing was called for. This was properly the work of a research department, and one of the aims of the institution mentioned in the Articles of Association was to undertake research work.

Railway Electrification in Italy and Switzerland

Mr. Raymond Carpmael, Chief Engineer of the Great Western Railway, presided over a well-attended meeting of the G.W.R. Lecture and Debating Society at Paddington station on February 7, when an illustrated lecture on "Railway Electrification in Italy and Switzerland" was delivered by Mr. G. A. B. Leishman, of the London Midland & Scottish Railway.

The speaker said that Switzerland possesses a greater mileage of electrified track (3,000 track miles) than any other European country. In both Switzerland and Italy, where electrification has been undertaken for similar reasons, ambitious programmes of development are in course of fulfilment. The primary reasons for investigating electric traction in Italy and Switzerland were tunnels and heavy approach gradients, while the impulse to extending electrification was the shortage of coal, or alternatively the development of domestic sources of energy. Switzerland, with its great Alpine barriers, lies athwart the direct route from London and Paris to Italy and the Near East, and only the construction of the great Simplon and Gotthard tunnels enabled the direct route to be followed. The first railway electrification in Switzerland, as distinct from tramways, was the Burgdorf-Thun line in 1899, approximately 25 miles in length, on the three-phase system. This, and the Burgdorf-Langnau, are now the only three-phase lines in Switzerland, the single-phase system, first introduced in 1907, being now almost universal at $16\frac{2}{3}$ cycles, 15,000 volts. The main development has been post-war, the year 1928 seeing the complete electrification of all the principal Swiss Federal Railways' trunk lines. In Switzerland, as in Italy, the hydro-electric power stations are of two types, which may be called summer and winter stations. The summer stations derive their energy from the melting of winter snows, while the winter stations are situated on the rivers and often operate in conjunction with storage reservoirs.

A number of interesting lantern slides were shown illustrating the development of Swiss electric locomotive practice, culminating in the production for the Gotthard line of the Oerlikon heavy-duty combined freight and passenger locomotives, with eight driving axles. This type of locomotive is of 8,800 h.p., and over 111 ft. long.

It is not generally appreciated that Italy is in effect hardly less hilly in character than Switzerland. Electrification was first investigated in Italy by a commission appointed towards the end of the nineteenth century, and trials were made on three different systems, resulting in the adoption of the three-phase system, the first line being opened in 1902.

The three-phase system has many desirable features — a comparatively high contact line voltage, high voltage motors avoiding a heavy transformer, and the possibility of providing for automatic regeneration. Its main drawback lies in the necessity for two overhead conductors, imposing complications in overhead equipment. After the nationalisation of Italian railways in 1905, further attention was given to electrification, and prior to the war considerable progress was made, notably around Genoa, with its three-phase system at 3,600 volts, $16\frac{2}{3}$ cycles. Some further progress was made around Turin during the war, but it was not until after 1920, when the 300-mile line between Modane and Leghorn was completed, that extensive experience was gained in running a heavy high-speed service. The lack of indigenous coal—emphasised during the war—coupled with an abundant potential source of energy from water power, has been the factor encouraging development of electrification in Italy, which has been most marked since 1920. In 1928 two interesting experiments were undertaken with two new systems: the Benevento-Foggia line across the Apennines at 3,000 volts d.c., and the Rome-Sulmona line at 10,000 volts, three-phase, 45 cycles.

The supply of electricity for all purposes is controlled by the Italian Government, but a number of private companies are concerned in the question of transmission of energy. The State Railways obtain power both from their own generating stations and from these private companies, and the railway transmission systems are linked up as far as possible with those already in existence.

As in the case of Switzerland, an interesting and informative series of slides was displayed, illustrating various types of power equipment and locomotives in use in Italy.

THE OTTOMAN RAILWAY FROM SMYRNA TO AIDIN.—Press reports from Ankara have stated that the Turkish Minister of Finance has agreed in principle to a figure for the purchase of this railway, the purchase price to be payable over 40 years. It is added that the Council of Ministers has yet to confirm the arrangement. In connection with this, Mr. James Iceton, Acting Secretary of the company, stated in a letter to the editor of *The Times* that the company had received from its representatives no confirmation of the statement that negotiations for sale to the Turkish Government had resulted in an agreement. He added that suggestions had been made for the acquisition of the railway by the Turkish Government and conversations had been proceeding, but beyond confirming that fact the board considered that in the interests of the shareholders no further announcement could be made at the moment. (Earlier references to the proposed purchase were made in our issues of August 3 and September 28 last.)

Westinghouse Brake and Signal Company

The brake contract with the Polish State Railways—Power signalling and economical railway operation

In the course of his speech at the annual general meeting of the Westinghouse Brake and Saxby Signal Company, which was held last week, the Rt. Hon. Lord Southborough, (the Chairman) gave some interesting particulars concerning the Polish brake contract referred to in our issue of November 30, 1934. Other matters discussed were the economies to be effected by the adoption of power signalling and the encouraging outlook for the future. At an extraordinary general meeting, which followed the annual meeting, unanimous approval was given to change the name of the company from "Westinghouse Brake and Saxby Signal Company" to "Westinghouse Brake and Signal Company." Below we give some extracts from Lord Southborough's speech dealing with the above mentioned and other subjects:—

It was in January, 1934, that the press made the first announcement that we had signed a preliminary contract with the Polish State Railways in connection with the equipping of 39,000 wagons with air brakes and of 73,000 wagons with the continuous piping and couplings. The negotiations which had been carried on in Warsaw by Captain B. H. Peter, our Managing Director, and which resulted in the signing of that preliminary contract, were continued in London. A delegation of Polish Government officials, headed by Mr. Julian Piasecki, the Vice-Minister of Communication, and Mr. Adam Koc, the Vice-Minister of Finance, came to London. The result of these continued negotiations was that a final contract was signed between the Polish State Railways and our company on April 24, 1934, which was subsequently ratified, and at the end of June, 1934, passed into operation.

The work is being divided between England and Poland, and satisfactory sub-contracts with Polish manufacturers of the highest standing have been made. A very happy relationship between ourselves and those with whom we are working there has been established.

The English portion of the work has provided, and will continue to provide, employment for many additional men at our works at Chippenham, and there can be no question that the contract is of great importance to our company. We have also made sub-contracts in this country, under which large quantities of raw materials will be delivered over a term of years, and this has provided work for those employed in other industries.

We desire to pay a tribute to Mr. Piasecki and to Mr. Koc for the patient and courteous manner in which they conducted the negotiations with us. These gentlemen were thoroughly conversant with what was required for their railways, and we were in the happy position of being able to supply the requirements in all respects. They conducted the negotiations in the most able manner and with great dispatch, considering the magnitude of the contract and the many difficult problems which had to be faced and solved.

If I may say so, our experience of the conduct of the negotiations, and of the subsequent business arrangements in Poland, has given us great satisfaction. We feel that we have entered into really friendly relations with the most important statesmen and officials in the country, and that we may look forward to close co-operation and smooth working to bring this great railway development to a highly successful conclusion. Poland is making rapid progress, and Captain Peter and our officials out there have the greatest confidence in and respect for the country and its people.

As relative to the negotiations, I should also like to acknowledge with pleasure the valuable assistance rendered to us by the Export Credits Guarantee Department, in connection with the negotiating and financing of the contract. It was of paramount importance to us to have the advice and practical assistance of our Government.

When parting from the Polish contract for today, I must tell you how deeply indebted the company is to Captain Peter, the Managing Director, for his able handling of the negotiations with our friends from Poland. He was of the greatest possible assistance to us politically and technically, and I venture to believe that he was also able to do much to promote the interests of the Polish State Railways. Then, again, since the signing of the contract, Captain Peter has been constantly on the Continent, watching the development of the business, and we shall largely depend upon him for his support during the coming years. He has our grateful thanks.

Power Signalling and Economical Working

Turning again to our more domestic concerns, the power signalling side of the business has brought us important contracts, in the face of the usual competition. I referred on the last occasion when I had the pleasure of addressing you, to the completion of the electrification of the London to Brighton line of the Southern Railway, for which our company supplied the railway signalling and brake appliances. I congratulated the Southern Railway Company and expressed the hope that their venture would not only prove of great service to the public, but would be remunerative to the company itself. The Southern Railway has made it public that they are very pleased with the results of the electrification of their line from London to Brighton. The point which is of most interest to us was made by the Chairman of the Southern Railway, at the annual general meeting in March, 1934, when he said:—

Our officers are to be congratulated upon the economies that have been effected. To some extent the economies are the outcome of the expenditure devoted in recent years to the carrying out of works for the improvement and modernising of our undertaking. As a striking example of what has been accomplished in this way, I may mention the installation of up-to-date methods of signalling which has enabled us to close more than 200 signal-boxes and to effect a saving of some £90,000 a year in the cost of signalling.

Gentlemen, I think we can claim that that is most striking advocacy of the benefits to be derived from the adoption of power signalling of the types manufactured and recommended by your company.

The Westinghouse Metal Rectifier continues to be not only of great value in an ever-widening field of engineering science, but, as a consequence, it is of considerable importance and benefit to us. We continue to find new fields in which the rectifier can be used successfully, some of the latest developments being in connection with plating plants, broadcast transmitters, and Government telephone services. Some time ago the limit of output was 10 kW.; to-day we have reached over 70 kW., and we expect to reach even higher limits.

Encouraging Prospects

With regard to the future, I can say, from my knowledge of the present position, that the prospects of the company are decidedly encouraging. In the last 10 months, apart from the Polish contract, we have made rapid improvement, and our order book is in a very healthy condition. We hope that this progress will continue, and if it does, we have every reason to believe that we may be well satisfied with the result of this year's work.

During the last two years, when I have had to tell you from this chair that our general business was suffering from the economic difficulties—so widespread, really universal—we have insisted upon economies in every direction, but the board has also resolutely refrained from taking any step which would leave our undertaking, our resources, and our personnel less capable of rising to the occasion when the trade conditions improved. This policy has been rewarded, for, in the last few months, a very heavy and unusual strain has been placed upon our staff, our equipment, our labour demands,

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and our general resources. I am pleased to tell you that, owing to this policy, we have been able to face the strain that has come upon us recently. Your directors feel that their policy of quiet preparation has been justified by the results achieved.

In conclusion it is our duty and our pleasure to express to Captain B. H. Peter, the Managing Director, and his staff our keen appreciation of their devotion to the best interests of the company and our grateful thanks for their ability and efficiency. We are glad to know that a sincere good fellowship exists between all concerned, and that loyalty and service to the company actuate all our officers, staff, and employees.

Railway Shareholders' Alleged Grievances

In the House of Lords on February 13 Lord Monkswell drew attention to the grievances of shareholders in British railways and to the obstacles which hindered them from taking organised action to remove these grievances; he asked His Majesty's Government whether they would take steps to facilitate organised action on the part of the railway shareholders so as to put the railway shareholders in as favourable a position to enforce their demands as was now occupied by the railway servants' trade unions. His Lordship first contrasted the strong position of railwaymen's trade unions with the position of railway shareholders. As to railway directors, with rarest exceptions they had no time or opportunity to exercise their powers for practical purposes. The railways were controlled by the railway officials. If the shareholders were organised they could do something practical, but the railway officials did exactly what they pleased, and they used their powers to the full. As to what action Government could take, he put forward a few general suggestions, among them being a power to obtain the names and addresses of all shareholders.

Lord Templemore, replying, said that the Government could not accept general statements impugning directors and officials. It could not be maintained that the officials fought against the shareholders. If it was contended that railway shareholders should have the names and addresses of all shareholders and the amounts of their holdings, Section 10 of the Companies Clauses Consolidation Act, 1845, set out that a register of shareholders should be provided, and every shareholder could peruse those registers. Under other Acts a card index could be substituted for the address book. In any case, the value of a list was discounted, because the names might be those of nominees and not the real owners. If it was suggested that shareholders should be given the right to check the results of voting by proxy, that seemed an unjustifiable aspersion on the good faith of directors. It was conceivable that such a power might be used by a minority of shareholders to prevent the efficiency of meetings. In general, the Government did not consider that railway shareholders suffered disability as compared with other shareholders.

Lord Daryngton pointed out that railway shareholders had the opportunity of joining the British railway stockholders' organisation.

The subject dropped.

G.W.R. Alterations at Old Oak Common, London

An extensive scheme to facilitate the formation of passenger trains is to be carried out by the G.W.R. at Old Oak Common, the Engine and Carriage Depot for Paddington station. The depot handles some 2,000 passenger coaches daily, empty stock being reformed to provide out-going trains. The time allowed for this is sometimes as short as 2½ hours during which the coaches and restaurant cars have to make a three-mile journey each way, be examined, cleaned, equipped, and reformed into outgoing order.

Considerable shunting operations, therefore, are involved throughout the twenty-four hours, and an average of five cuts is made to every empty stock train arriving at the depot. At present, there are some 10½ miles of sidings at Old Oak including five roads for the reception of empty trains coming in from Paddington station. Not more than nine to twelve coaches can be accommodated in each of these roads, whereas many of the longer trains today run to fourteen to seventeen coaches, and much additional shunting in such cases is necessary. In addition, the incoming and outgoing lines to the depot cross each other at both the east and the west ends of the yard.

The new scheme involves the relaying of seven miles of sidings and the construction of three and a half miles of new sidings. There will be seven reception roads, each of twenty-coach capacity, instead of the five shorter roads as at present. Separate in and out lines to and from Paddington at both the east and the west ends of the yard will be provided, and, in addition, the twenty 1,000-ft. sidings in the covered carriage shed, itself as large as Paddington station, are to be re-arranged to simplify shunting. This shed will be equipped with an electric charging plant for train lighting batteries. Steam heating arrangements are to be extended so that any, or all, of the trains standing on the forty sidings can be heated simultaneously. New central-heated offices and mess rooms are to be built for the staff, which numbers between 500 and 600.

An automatic telephone exchange is to be installed, and telephones will be provided at more than seventy selected points throughout the depot and sidings. This will considerably expedite the work of forming the trains, particularly during fog, as shunters will be able to communicate with each other, the depot, and any of the seven signalboxes, or receive instructions without crossing the railway lines. Water columns are to be erected where engines can take water without stopping their shunting work.

The existing goods marshalling sidings are to be concentrated on the south of the main line, and this space will be utilised for the extension of the reception roads. A 70-foot turntable is to replace the existing one of 50 feet, and this will permit the largest locomotives or rolling-stock used by the company being turned in the depot. A system of lighting will be employed to give equal illumination throughout the whole area.

Work on the new scheme has already begun, and it is hoped that essential features will be completed in time for the summer traffic.

A Milan Steam Tramway

On p. 302 we reproduce a photograph showing a steam locomotive on a tramway or light railway in Milan. This line, which runs from Milan to Magenta, was inaugurated in September, 1879, and was one of the first of its kind radiating from Milan; it is 23 km. (14¼ miles) long.

The Milan station of this railway has the unusual feature of being situated in the courtyard of a house in Corso Vercelli, an important thoroughfare, almost in the centre of the city. At the time the concession for the line was given to run on the high road, the Provincial Council issued a number of byelaws which stipulated, among other conditions, that the whole engine, including all moving parts, was to be enclosed.

Furthermore, the engine and tender must have a maximum length of 3 m. (9 ft. 10 in.) and resemble in appearance the passenger carriages. Speed was restricted to 15 km.p.h. (9⅜ m.p.h.) in the country and to 10 km.p.h. (6¼ m.p.h.) within the boundaries of Milan.

The concession for this quaint railway expired in 1929 and has since been renewed from year to year. The line still carries a daily average of 2,400 workmen besides other passengers, notwithstanding that it takes 1¼ hours to travel from Milan to Magenta. The present service cannot be improved as long as the renewal of the concession is made from year to year, and it is probable that the line, which is one of the very few of its kind in the neighbourhood of Milan, will disappear in the near future.

NOTES AND NEWS

Railway Students' Association Convention.—This year's convention will be held at Birmingham from July 12 to 15. The party will have headquarters at the Chancellor's Hall, Augustus Road, Edgbaston, where meals will be taken and each night spent.

Trials of Rubber-tyred Railcar on the L.M.S.R.—In conjunction with Armstrong Siddeley Motors Limited, the L.M.S.R. is conducting trials of a 56-seater railcar known as the Coventry pneumatic railcar. This vehicle, which is intended for secondary express services, is capable of a maximum speed of about 70 m.p.h., and runs on sixteen wheels.

Road Accidents.—The Ministry of Transport return for the week ended February 9 of persons killed or injured in road accidents is as follows :—

	Killed	Deaths resulting from previous accidents	Injured
England	86 (85)	26 (36)	2,859 (2,728)
Wales ...	7 (3)	— (—)	122 (113)
Scotland	8 (11)	3 (5)	285 (299)
	101 (99)	29 (41)	3,266 (3,140)

The total fatalities for the week were, therefore, 130, as compared with 140 for the previous week.

Grand Trunk Stockholders.—The directors of Grand Trunk Junior Stocks Limited state that their solicitors have received an intimation from the Registrar of the Privy Council that the petition by Mr. Lovibond (on behalf of holders of preference and consolidated stocks) for special leave to appeal against a judgment of the Appeal Court in Ontario reversing the order made in June last by Mr. Justice Middleton in Ontario admitting the right of Mr. Lovibond to appeal to the Judical Committee of the Privy Council against a previous judgment of the Appeal Court in Ontario dismissing his action, will not be placed in the list for hearing until next month. The annual general meeting of the company will accordingly be further deferred until after the petition has been heard.

Guildford Station, Southern Railway.—Work is about to begin on a new footbridge for Guildford station, which when completed will greatly facilitate access to all platforms. At present the only access is via the station approach and booking hall, but when the new bridge is ready passengers will have direct entrance from Guildford Park Road, that is, from the other side of the railway, where a passimeter office, of attractive design, will be installed. The new bridge will be 380 ft. long and 8 ft. wide. It will be covered with asbestos corrugated roofing, with glazed sides, and its position will be approximately over the existing subway, which runs to the various platforms from the main booking hall. This subway, however, will still be available for use.

Proposed S.M.T. Purchase.—The Scottish Motor Traction Co. Ltd., in which the L.M.S.R. and L.N.E.R. are largely interested, has offered to buy at 3s. 9d. a share the 1,500,000 ordinary shares of 5s. each of the Fife Tramway Light & Power Co. Ltd. The latter company controls the whole issued share capital of the Dunfermline & District Traction Company and the Falkirk & District Traction Company.

Agreed Charges.—Twenty-five more applications for the approval of agreed charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, have been lodged with the Railway Rates Tribunal, as will be seen from the legal notice published on page 314. These applications may be inspected at the office of the Tribunal, 2, Clement's Inn, Strand, W.C.2, at the Railway Clearing House, London, and at 11 named centres outside London. A copy of each application (1s. post free) may be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, S.W.1.

Re-organisation of Chief Engineer's Department, L.M.S.R.—The Chief Engineer's Department of the L.M.S.R. has hitherto comprised four divisions, centred at Crewe, Derby, Manchester and Glasgow, with a head office at Euston. A re-organisation of the department has been decided upon, the object being to absorb the work at present undertaken by the Divisional Engineers in England into one headquarters office in London. The building chosen to house the centralised Engineer's Department is St. Pancras Hotel, and the requisite accommodation is now being converted into offices. It is hoped that by the early summer the reorganisation will be complete.

L.P.T.B. and the Tilling Claim.—The award of the London Passenger Transport Arbitration Tribunal was made on Monday in terms agreed between Thomas Tilling Limited and the L.P.T. Board, namely, £82,500 in C stock in respect of the severance and apportionment claims, as against the £136,644 originally sought. We recorded on page 908 of our November 30, 1934, issue the award of the tribunal on the main Tilling claim, namely £1,750,000 in stock (against the claim of £3,162,912 and L.P.T.B. offer of £1,032,221). In the case of Tilling & British Automobile Traction Limited the total claim was for £313,195, which included £10,000 severance claim, £3,003 apportionment, and £17,022 book value of assets and stores. The compromise figure reached in this case was £166,093 on the main claim, to be allotted as to the amount for assets in equal amounts (£8,511) of A and B stock, and the remainder, £149,071, in C stock, all issued at par. Severance and apportionment claims were agreed at £7,500 in C stock, making a total of £173,593 to the T.B.A.T. Company.

"Cock o' the North" on Line Trials in France.—Mr. Gresley's 2-8-2 express locomotive, No. 2001, *Cock o' the North*, after a month's trial on the Vitry test bench, has been undergoing trials on the open line. The locomotive, hauling three French "brake" locomotives and a dynamometer car, is reported to have covered the 69½ miles between Orleans (Les Aubrais) and Tours (St. Pierre des Corps) in one hour.

Railway and other Bills in Parliament.—The Electric Supply Bill passed through the Committee stage in the House of Lords on February 7 without amendment. The section affecting railways, it may be recalled, is clause 4, which allows the Central Electricity Board to give electricity supplies direct to any railway company. There was no discussion on the clause. The Bill received the Royal Assent on February 12. Some 39 petitions have been deposited against the L.P.T. Bill which was read a second time in the House of Commons on February 7 and committed. The L.M.S.R. Bill was on Monday (February 11) read a second time in the House of Commons and referred to the Examiners of Petitions for Private Bills.

New Stations for North Kent.—The Southern Railway is providing two new stations, one between Sidcup and Bexley and the other between Eltham Park and Welling. The former will be known as Albany Park, and the latter as Falconwood. Work is proceeding at Albany Park, where roofing, platforms, and an overbridge are in hand. As it is the intention to have the station ready for the summer traffic, only temporary booking office accommodation is being provided for the time being, but this will give place later to attractive permanent buildings. At Falconwood, where work has not begun but plans have been passed, the station will have the passimeter type of booking office.

New Goods Yard at Portsmouth, Southern Railway.—A new goods yard is now being constructed at Fratton, just outside Portsmouth, at a cost of approximately £70,000. The new yard will have a two-storey goods shed 500 ft. long by 135 ft. wide with a warehouse 100 ft. by 135 ft. over the northern end, having lift connection with ground floor. The yard will accommodate 853 wagons, and will be provided with a monorail crane, a 10-ton travelling Goliath electric crane for transporting goods from rail to road vehicles, and a cart weighbridge for weighing vehicles up to 20 tons. When the new yard is completed, the existing goods yard in the centre of Portsmouth will be closed, and the site sold to the Corporation.

XUM

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 6th Week			Totals to Date		
	1935	1934	Inc. or Dec.	1935	1934	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,926¼ mls.)						
Passenger-train traffic...	363,000	358,000	+ 5,000	2,158,000	2,112,000	+ 46,000
Merchandise, &c. ...	449,000	455,000	− 6,000	2,559,000	2,597,000	− 38,000
Coal and coke ...	280,000	284,000	− 4,000	1,619,000	1,635,000	− 16,000
Goods-train traffic ...	729,000	739,000	− 10,000	4,178,000	4,232,000	− 54,000
Total receipts	1,092,000	1,097,000	− 5,000	6,336,000	6,344,000	− 8,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic...	245,000	240,000	+ 5,000	1,453,000	1,416,000	+ 37,000
Merchandise, &c. ...	295,000	312,000	− 17,000	1,813,000	1,863,000	− 50,000
Coal and coke ...	253,000	261,000	− 8,000	1,467,000	1,500,000	− 33,000
Goods-train traffic ...	548,000	573,000	− 25,000	3,280,000	3,363,000	− 83,000
Total receipts	793,000	813,000	− 20,000	4,733,000	4,779,000	− 46,000
G.W.R. (3,749¼ mls.)						
Passenger-train traffic...	149,000	147,000	+ 2,000	939,000	910,000	+ 29,000
Merchandise, &c. ...	173,000	175,000	− 2,000	1,050,000	1,027,000	+ 23,000
Coal and coke ...	105,000	113,000	− 8,000	639,000	666,000	− 27,000
Goods-train traffic ...	278,000	288,000	− 10,000	1,689,000	1,693,000	− 4,000
Total receipts	427,000	435,000	− 8,000	2,628,000	2,603,000	+ 25,000
S.R. (2,172 mls.)						
Passenger-train traffic...	229,000	225,000	+ 4,000	1,397,000	1,360,000	+ 37,000
Merchandise, &c. ...	53,000	61,000	− 8,000	330,000	358,000	− 28,000
Coal and coke ...	31,000	36,000	− 5,000	209,000	225,000	− 16,000
Goods-train traffic ...	84,000	97,000	− 13,000	539,000	583,000	− 44,000
Total receipts	313,000	322,000	− 9,000	1,936,000	1,943,000	− 7,000
Liverpool Overhead ... (6½ mls.)	1,115	1,063	+ 52	6,588	6,621	− 33
Mersey (4½ mls.) ...	3,948	4,023	− 75	25,428	25,988	− 560
*London Passenger Transport Board ...	514,900	513,200	+ 1,700	17,004,000	16,675,100	+ 328,900
IRELAND						
Belfast & C.D. pass. (80 mls.)	1,665	1,672	− 7	10,622	10,679	− 57
,, ,, goods	560	573	− 13	2,724	3,074	− 350
,, ,, total	2,225	2,245	− 20	13,346	13,753	− 407
Great Northern pass. (543 mls.)	7,450	7,050	+ 400	46,300	42,400	+ 3,900
,, ,, goods	6,550	7,350	− 800	47,750	47,550	+ 200
,, ,, total	14,000	14,400	− 400	94,050	89,950	+ 4,100
Great Southern pass. (2,124 mls.)	18,187	18,953	− 766	111,372	110,575	+ 797
,, ,, goods	34,256	35,007	− 751	238,199	189,257	+ 48,942
,, ,, total	52,443	53,960	− 1,517	349,571	299,832	+ 49,739

* 32nd week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes

Forthcoming Events

Feb. 15 (*Fri.*).—Institute of Transport (Leeds Graduate), at Church Inst., Albion Place, 7 p.m. "Railway Organisation," by Mr. F. L. Hick.

Institute of Transport (London), at Connaught Rooms, W.C.2. Annual Dinner, 6.30 for 7.

Feb. 16 (*Sat.*).—L.M.S.R. (London) Amateur Dramatic Society, at Grafton Theatre, Tottenham Court Road, W.1. "The Man who Wouldn't go to Heaven."

Feb. 18 (*Mon.*).—G.W.R. (Birmingham) Lecture and Debating Society, at Great Western Hotel, Snow Hill Station, 6.30 p.m. "The Contribution of the Stores Department to Railway Efficiency," by Mr. H. Marsh.

Institute of Transport (Scottish), at Royal British Hotel, Princes Street, Edinburgh, 7.15 p.m. "A Recent Development in Coasting Shipping," by Mr. J. R. Cowper.

Feb. 18-Mar. 1.—British Industries Fair, at Olympia and White City, London.

Feb. 19 (*Tues.*).—Institute of Transport (Metropolitan Transport), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. "Methods of Negotiation between Transport Undertakings, their Employees and Trade Unions," by Mr. J. Cliff.

Feb. 20 (*Wed.*).—Engineers' Study Group on Economics, at Denison House, Vauxhall Bridge Road, London, S.W.1, 8 p.m. "Planned Money," by Sir Basil Blackett.

Institute of Transport (Newcastle), at Royal Station Hotel, 6 p.m. "The Application of Diesel Engines to Passenger Road Transport Vehicles," by Mr. G. W. Hayter.

Institution of Locomotive Engineers (Birmingham), at Queen's Hotel, 6.45 p.m. "Ejectors," by Mr. C. Arnold.

L.N.E.R. (Darlington) Lecture and Debating Society, at North Road Inst., 7.20 p.m. "Whitemoor Marshalling Yard," by Mr. R. Gardiner.

Feb. 21 (*Thurs.*).—Institution of Locomotive Engineers (Scottish), at Royal Technical College, George Street, Glasgow, 7.30 p.m. Ordinary Meeting.

Feb. 22 (*Fri.*).—Institute of Transport (Manchester-Liverpool), at Midland Hotel, Manchester, 6.30 p.m. "The Future of Transport," by Mr. G. B. Lissenden.

Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 5.30 p.m. Annual General Meeting.

Railway Club, at Royal Scottish Corporation, Fleur-de-lis Court, London, E.C.4, 7.15 p.m. Annual General Meeting.

Railway Students' Association (Edinburgh), at Goold Hall, St. Andrew Square, 7.30 p.m. "The Law and Transport," by Mr. J. W. Loudon.

March 11 (*Mon.*)—Retired Railway Officers' Society. Annual Luncheon in Abercorn Rooms, Liverpool Street Station Hotel, E.C.2. at 12.45 for 1 o'clock.

British and Irish Railways Stocks and Shares

Stocks	Highest 1934	Lowest 1934	Prices Feb. 13, 1935	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	66½	48½	52	−1½
5% Con. Prefce. ...	118	109	118½	−½
5% Red.Pref.(1950)	115	107	116½	—
4% Deb.	117	105	113½	−3
4½% Deb.... ...	119	109	118½	−2
4½% Deb.... ...	129½	115¼	126½	−2
5% Deb.	135	126¼	138½	−1
2½% Deb.... ...	75	64	81½	—
5% Rt. Charge ...	134 7/16	123¼	134½	—
5% Cons. Guar. ...	132¾	121¾	133½	−½
L.M.S.R.				
Ord.	30½	19½	18½	—
4% Prefce. (1923)	64¼	41	48½	+½
4% Prefce. ...	87	69½	82½	−2
5% Red. Prf. (1955)	107	92½	104½	−1½
4% Deb.	114⅛	100½	105½	−2½
5% Red.Deb.(1952)	118 11/16	111¼	118½	—
4% Guar.	106½	96¾	102½	−2
L.N.E.R.				
5% Pref. Ord. ...	24¾	13½	12½	—
Def. Ord.	11½	6⅞	6½	—
4% First Prefce. ...	76	59½	66½	−1½
4% Second Prefce.	47	25½	25	−1
5% Red.Pref.(1955)	94½	80	87½	−2
4% First Guar. ...	104	92	98½	−2½
4% Second Guar.	97⅞	86½	93½	−2
3% Deb.	90	74½	80⅛	−3
4% Deb.	114	99¼	104½	−2½
5% Red.Deb.(1947)	117	108	117	—
4½% Sinking Fund Red. Deb.	111¼	105¼	110½	—
SOUTHERN				
Pref. Ord.... ...	90	63⅛	83	+3
Def. Ord.	32⅝	19	21½	+1½
5% Prefce. ...	118 3/16	107½	119⅛	—
5% Red.Pref.(1964)	115¾	107½	116½	—
5% Guar. Prefce.	132	120¾	133½	—
5% Red.Guar.Pref. (1957)	119½	113	120	−½
4% Deb.	116½	103¼	112½	−3
5% Deb.	134	124 15/16	136½	+2
4% Red. Deb. 1962–67	113 11/16	105 1/16	114	—
BELFAST & C.D.				
Ord.	6	5	5¼	—
FORTH BRIDGE				
4% Deb.	110	100	109½	—
4% Guar. ...	110	100	109½	—
G. NORTHERN (IRELAND)				
Ord.	9¾	4 15/16	10	—
G. SOUTHERN (IRELAND)				
Ord.	25	12½	24½	—
Prefce.	21½	13 15/16	27⅛	+1⅛
Guar.	48	39	62	+4
Deb.	67	59	76½	+1
L.P.T.B.				
4½% "A" ...	126	115	125½	−3
5% "A"	135½	124½	135½	−3
4½% "T.F.A." ...	113½	107½	113	—
5% "B"	131¾	118	126½	−4
"C"	97	73	94	—
MERSEY				
Ord.	15¼	7	14*	—
4% Perp. Deb. ...	93½	82½	94½	+1
3% Perp. Deb. ...	66½	61½	69½	+1
3% Perp. Prefce....	54	44⅛	52½*	+1

* ex dividend

CONTRACTS AND TENDERS

Hurst, Nelson & Co. Ltd. has received an order for 10 petrol tank wagons without bogies for the Rhodesia Railways, to be supplied to the inspection of the consulting engineers, Messrs. Sir Douglas Fox & Partners.

Wagons for Egypt

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the Egyptian State Railways Administration for 250 standard-gauge 10-ton all-steel box trucks. The inquiry for these wagons was recorded in this column in our October 12, 1934, issue, and tenders were due in by January 2. The inquiry was for alternative batches of 100, 150, 200 and 250 wagons.

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has also received an order from the Liverpool Corporation Electricity Supply Department for twenty 20-ton all-steel hopper-bottomed coal wagons. These wagons are similar to a number already supplied by the Metropolitan-Cammell Company to this purchaser on several previous occasions.

C. H. Johnson & Sons Ltd. has received an order for one portable coal elevator for loading coal on locomotive tenders, from the Entre Rios Railways.

Charles Roberts & Co. Ltd. has received an order for thirty-four 14-ton class A tank wagons for the conveyance of inflammable liquids from the National Benzole Co. Ltd.

J. Baker & Bessemer Limited has received an order for 160 solid rolled wrought steel disc wheels for tenders, coaches and wagons, from the Peruvian Corporation.

Miller & Co. Ltd. has received an order from the Bengal–Nagpur Railway for 500 cast-iron wheels.

The United Steel Co. Ltd. (Workington Iron & Steel Branch) has received an order from the Gondal Railway for 785 tons of 50-lb. B.S. F.F. rails and 8 tons of fishplates, to be supplied to the inspection of the consulting engineers, Messrs. Robert White & Partners.

Stewarts and Lloyds Limited has received an order for 2,500 acid-resisting solid drawn steel boiler tubes, from the Central Argentine Railway.

The G.W.R. is to replace 19 of the general cargo cranes at Barry docks by eight modern three-ton luffing hydraulic cranes.

Howell & Co. Ltd. has received an order for 580 galvanised solid drawn Aquacidox steel boiler tubes, from the Cordoba Central Railway.

Howell & Co. Ltd. has also received an order for 575 solid drawn black steel Aquacidox boiler tubes, from the Buenos Ayres Midland Railway.

W. Griffith & Sons Limited has received an order from the Bengal–Nagpur Railway for approximately 1,500 laminated and door check springs.

Further Railcars for South America

Ganz & Co. has received an order from the Argentine State Railways for 18 diesel-mechanical railcars. Each car is to be 75 ft. 6 in. in length, and of the total order 29 are for metre-gauge service, two for the 1·435-m. gauge, and three for the 1·676-m. gauge. They are variously intended for suburban, local, and express long-distance traffic. Each of the eight-wheeled double-bogie cars will be driven by a Ganz–Jendrassik 220/275-h.p. engine, which together with the mechanical power transmission will be mounted on one of the two bogies. The mechanical portions of the cars of like gauge will be interchangeable.

The Associated Equipment Co. Ltd. has received a repeat order from the Halifax Corporation Tramways & Motors (with which the L.N.E. and L.M.S. Railways are associated), for two oil-engined Regent passenger vehicles.

Jonas Woodhead & Sons Limited has received an order for 184 laminated engine bearing springs for the Bengal–Nagpur Railway.

Indian Wagon Orders

The Government of India Railway Department (Railway Board) has placed orders, following the first call for tenders, for the 1935-36 requirements of broad and metre gauge I.R.S. wagons, without wheels and axles, as below :—

Burn & Co. Ltd.: For M. & S.M.R., two CE at Rs. 5,744 each, 74 MCJ at Rs. 2,357 each, two MCE at Rs. 4,198 each, five MBTOX at Rs 9,285 each, 12 MBR at Rs. 5,665 each, 15 MBOC at Rs. 5,380; for E.B.R., 10 BR at Rs. 8,338 each, 75 MOM at Rs. 2,471 each, 400 MCJ at Rs. 2,490 each, and 11 MBR at Rs. 5,951 each.

Jessop & Co. Ltd.: For M. & S.M.R., 36 BVG at Rs. 5,343 each, 11 TO at Rs. 7,714 each, and four MBVG at Rs. 5,452 each; for E.B.R., 26 BVG at Rs. 5,325 each, and 21 MBVG at Rs. 5,784 each; for E.I.R., 25 BVG at Rs. 5,343 each and 25 TO at Rs. 7,599 each.

Jessop & Co. Ltd. has received an order from the East Indian Railway for one hydraulic four-column press at a total price of Rs. 11,146.

The English Steel Corporation Limited has received an order for 16 steel locomotive crank axles for the Bengal–Nagpur Railway.

The South Indian Railway has placed the following orders :—

Wm. Beardmore & Co. Ltd.: 112 pairs of metre-gauge wheels and axles.

Hurst Nelson & Co. Ltd.: 52 pairs of broad-gauge wheels and axles.

John Spencer & Son: 50 spare broad-gauge axles.

Goodyear Tyre & Rubber Co. Ltd.: Washout hoses.

Uddeholme General Agencies: 2,350 solid drawn steel boiler tubes

These materials and components are to be supplied to the inspection of the consulting engineers. Messrs. Robert White & Partners.

Geo. Spencer Moulton & Co. (India) Ltd. has received an order from the Indian Stores Department for approx. 19,000 I.R. drawbar springs, at Rs. 1.1.9 each.

Mavor & Coulson Limited has received an order for one Arcwall chain coal cutter for the Bengal–Nagpur Railway.

Taylor Bros. & Co. Ltd. has received an order for 100 pairs of I.R.S. wheels and axles for the Bengal–Nagpur Railway.

Leyland Motors Limited has received orders from railway-associated road transport operators as follow : Thames Valley Traction Co. Ltd., 16 oil-engined Tigers and Titans; Scottish Motor Traction Co. Ltd., 10 oil-engined Tigers; County Motors (Lepton) Limited, three oil-engined Tigers; and Western Welsh Omnibus Co. Ltd., two oil-engined Cub passenger vehicles.

Thos. Firth & John Brown Limited has received an order from the Bengal–Nagpur Railway for 44 pairs of Davies wheels and axles.

The Exors. of James Mills Limited has received orders from the Indian Stores Department for 84,000 steel keys for 75-lb. D.H. rails, at a total price of Rs. 21,000, 50,000 steel keys for 85-lb. rails at a total price of Rs. 12,500, and a total of 41,000 cwt. of rail anchors at a total price of Rs. 28,189.

The Krupp Indian Trading Co. Ltd. has received orders from the Indian Stores Department for 95 locomotive tyres at total price of Rs. 11,970, 400 20-in. diam. chilled cast iron wheels at total price of Rs. 9,000, and 400 broad gauge carriage and wagon axles at total price of Rs. 48,350.

The Superheater Co. Ltd. has received an order for a quantity of superheater elements and headers, from the Bengal–Nagpur Railway.

Electrically-Driven Turntable Inquiry

The South African Railways & Harbours Administration is calling for tenders, to be presented in Johannesburg by March 4, for the supply of one 85-ft. electrically-driven turntable. Firms desirous of offering a turntable of United Kingdom manufacture can obtain further details from the Department of Overseas Trade.

The South African Railways & Harbours Administration is also calling for tenders, to be presented in Johannesburg by March 18, for the supply of mild steel plates to specification C.M.E. 9/1930, symbol No. 8 being the requirements for the period from July, 1935, to June, 1936. Further details can be obtained from the Department of Overseas Trade.

The Controller of Purchase, Indian Stores Department, Calcutta, invites tenders, receivable by March 5, for the supply on a rate contract basis during the period August 16, 1935, to August 15, 1936, of draw hook, draft gear and radial truck control springs.

The Royal State Railways Administration of Siam is calling for tenders, to be presented in Bangkok by April 5, for the supply of 1,610 wheel tyres for engines, carriages and wagons. Further details may be obtained from the Department of Overseas Trade.

LEGAL NOTICES

In the Court of the Railway Rates Tribunal.

Road and Rail Traffic Act, 1933. Agreed Charges

NOTICE IS HEREBY GIVEN that Applications for the approval of Agreed Charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, short particulars of which are set out in the Schedule hereto, have been lodged with the Railway Rates Tribunal.

The said Applications may be inspected at the Office of the Tribunal, 2, Clement's Inn, Strand, London, W.C.2, at any time during office hours and at the following places :—

LONDON : Railway Clearing House, 123, Seymour Street, N.W.1.
BIRMINGHAM : District Goods Manager's Office, Snow Hill, Great Western Railway.
CARDIFF : Divisional Superintendent's Office, Great Western Railway.
EXETER : Western Divisional Superintendent's Office, Southern Railway.
LEEDS : District Goods Manager's Office, Wellington Street, London & North Eastern Railway.
LEICESTER : District Goods and Passenger Manager's Office, London Midland & Scottish Railway.
MANCHESTER : District Goods Manager's Office, Hunt's Bank, London Midland & Scottish Railway.
SOUTHAMPTON : Southern Divisional Superintendent's Office, Southampton West, Southern Railway.
YORK : Goods Manager's Office, London & North Eastern Railway.
ABERDEEN : District Goods and Passenger Manager's Office, London Midland & Scottish Railway.
EDINBURGH : District Goods and Passenger Manager's Office, Waverley Station, London & North Eastern Railway.
GLASGOW : Commercial Manager's Office, Central Station, London Midland & Scottish Railway.

A copy of each Application lodged with the Tribunal can be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, Westminster, London, S.W.1, price 1s., post free.

Notices of objection by any parties entitled to object to the approval of any of the said Agreed Charges must state concisely the grounds of objection and must be filed at the office of the Registrar, 2, Clement's Inn, Strand, London, W.C.2, on or before the 1st day of March, 1935, and a copy thereof on or before the same day served on or sent by registered post to Mr. G. Cole Deacon, at the above address. A separate Notice must be filed and served in respect of each Application.

Each Notice filed must be on foolscap size paper and must be stamped with an adhesive fee stamp for 2s. 6d. (which can be purchased at the office of the Tribunal only). If sent by post for filing each Notice must be accompanied by a Postal Order for 2s. 6d. payable to the Registrar, when a stamp will be affixed at the office. A Notice by a Representative Body of Traders must contain a statement of the facts upon which such Body claims to represent a substantial number of traders interested in, or likely to be affected by the decision on, the application.

Four additional copies of each Notice must be lodged with the original at the office of the Registrar.

T. J. D. ATKINSON,
Registrar.

7th February, 1935.

Number of Application and Date of Lodgment	Parties to Agreement	Nature of Agreed Charge
1935, No. 50—Jan. 14, 1935	WIGGINS, TEAPE & ALEX PIRIE (SALES) LIMITED, Mansell Street, London, E.1, and the L. & N.E. Railway Co.	Per ton. Paper, in bales, bundles and rolls for printing and Paper in cases.
1935, No. 53—Feb. 1, 1935	G. H. MONK & CO. LTD., 217, Balsall Heath Road, Birmingham, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos., and L.P.T.B. This application by leave granted under Rule 4, relates also to Agreed Charges with other Registered Bacon Curers in Great Britain as specified therein	Per Pig. Live Pigs consigned to Registered Bacon Curers or their Agents.
1935, No. 54—Feb. 1, 1935	CHESEBROUGH MANUFACTURING COMPANY (CONSOLIDATED), Victoria Road, Willesden, London, N.W.10, and the G.W. and L.M. & S. Railway Cos.	Per ton. Druggists' Sundries, Hair Dressings, "Vaseline," Petroleum Jelly, and "Vaseline" Preparations and Advertising Matter.
1935, No. 55—Feb. 1, 1935	CROSSE & BLACKWELL LIMITED, Soho Square, London, W.1, and the G.W., L. & N.E., L.M. & S., and Southern Railway Cos., and L.P.T.B. *Applicable also to traffic consigned by :—* JAMES KEILLER & SON LTD., and CHOCOLAT TOBLER LIMITED	Per ton. (i) Confectionery; Pickles and Sauces; Preserves; Provisions; Empties returned to Suppliers. (ii) Goods and Empties, returned to the Trader.
1935, No. 56—Feb. 1, 1935	CROSSE & BLACKWELL LIMITED, Soho Square, London, W.1, and the G.W., L. & N.E., L.M. & S., and Southern Railway Cos., and L.P.T.B. *Applicable also to traffic consigned by :—* JAMES KEILLER & SON LTD. — CHOCOLAT TOBLER LIMITED E. LAZENBY & SON LTD. — R. A. BARCLAY LIMITED CHEF PRODUCTS LIMITED — FULCREEM CO. LTD. PLAISTOWE & CO. LTD. — SUNRISE PRESERVING CO. LTD.	Per ton. (i) Confectionery; Pickles and Sauces; Preserves; Provisions; Empties returned to Suppliers. (ii) Goods and Empties returned to the Trader.
1935, No. 57—Feb. 1, 1935	HORNE BROS. LTD., Oxford Street, London, W.1, and the G.W., L.M.& S., L. & N.E., and Southern Railway Cos.	Per ton. Boots and Shoes; Clothing; Cotton, Woollen and Linen Goods; Hats; Hosiery; Advertising Matter; Empties returned to Suppliers.
1935, No. 58—Feb. 1, 1935	MANN EGERTON & CO. LTD., Prince of Wales Road, Norwich, and the Midland and Great Northern Joint Committee and the L. & N.E. Railway Co.	Per ton. Garage Equipment, such as Axle Supports, Brake Testers, &c., School Furniture; Tables; Wood Mantelpieces; Empties returned to Suppliers.
1935, No. 59—Feb. 1, 1935	MOULDS & MOORE LIMITED, Barwell, Leicester, and the L.M. & S. Railway Co.	Per ton. Boots and Shoes; Empties returned to Suppliers.
1935, No. 60—Feb. 1, 1935	NEWTON CHAMBERS & CO. LTD., Thorncliffe, near Sheffield, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. "Izal" Toilet Rolls.
1935, No. 61—Feb. 1, 1933	PEARCE DUFF & CO. LTD., Spa Road, London, S.E.16, and the G.W., L. & N.E., L.M. & S., and Southern Railway Cos.	Per ton. Groceries and Preserves, such as those included in Exceptional Rates Lists G, H and S, as defined in the General Classification of Merchandise, Confectionery, Advertising Matter and Show Cards; Empties returned to Suppliers.
1935, No. 62—Feb. 1, 1935	PURNELL & PANTER LIMITED, Houlton Street, Bristol, and the G.W. and L.M. & S. Railway Cos.	Per ton. Malt Vinegar; Preserves; Pickles and Sauces; Empties returned to Suppliers.
1935, No. 63—Feb. 1, 1935	PURNELL & PANTER LIMITED, Houlton Street, Bristol, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos., and L.P.T.B.	Per ton. Empties returned to the Trader.
1935, No. 64—Feb. 1, 1935	SPILLERS LIMITED, 40, St. Mary Axe, London, E.C.3, and the G.W. and L.M. & S. Railway Cos.	Per ton. Dog Biscuits and Bird Seed; Hound Meal in less lots than 2 tons
1935, No. 65—Feb. 1, 1935	THE WASHINGTON CHEMICAL COMPANY, Branch of Turner & Newall Limited, Washington, Durham, and the L. & N.E. Railway Co.	Per ton. Insulating Material such as Composition, Slabs or Blocks; Asbestos and Asbestos Goods; Magnesia calcined, carbonate or fluid.
1935, No. 66—Feb. 1, 1935	WINTERINGHAM LIMITED, Stimpson Avenue, Northampton, and the L.M. & S. Railway Co.	Per ton. Toys.
1935, No. 67—Feb. 1, 1935	APLIN & BARRETT AND THE WESTERN COUNTIES CREAMERIES LIMITED, Yeovil, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. *Applicable also to traffic consigned by :—*C. & E. WALKER LIMITED	Per ton. Butter, Cheese, Cream, Sausages, Cooked and Preserved Meats, &c.
1935, No. 68—Feb. 1, 1935	BETTERWEAR PRODUCTS LIMITED, North Street, Romford, Essex, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Brushes and Polishes.
1935, No. 69—Feb. 1, 1935	BROOK TAVERNER & CO., Northumberland Street, Huddersfield, and the L.M. & S. Railway Co.	Per package. Woollen Goods and Pattern Books.
1935, No. 70—Feb. 1, 1935	BROWN & HAIGH, Wood Street Mills, Wigan, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Cloth and Clothing.
1935, No. 71—Feb. 1, 1935	COHEN & WILKS LIMITED, Aquatite Mills, Derby Street, Cheetham, Manchester, and the Cheshire Lines Committee and G.W., L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing and Advertising Matter.
1935, No. 72—Feb. 1, 1935	CO-OPERATIVE WHOLESALE SOCIETY LIMITED, Balloon Street, Manchester, and the L.M. & S. Railway Co.	Per package. Brassieres, Corsets, Suspender Belts, and Underbelts.
1935, No. 73—Feb. 1, 1935	MYERS & CO. (L. & H.) LTD., Trinity Street, Leeds, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1935, No. 74—Feb. 1, 1935	T. WALL & SONS LTD., The Friary, Acton, London, W.3, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Sausages, Cooked Meat, Meat Pies, Lard, Potted Meat and Pasties.
1935, No. 75—Feb. 1, 1935	EDWARD WEBB & SONS (STOURBRIDGE) LTD., Wordsley, Stourbridge, and the G.W. Railway Co.	Per package. Bulbs, Plants, Seeds and Horticultural Sundries.
1935, No. 76—Feb. 1, 1935	THE EFANDEM CO. LTD., Failings Park, Wolverhampton, and the G.W. and L.M. & S. Railway Cos. *Applicable also to traffic consigned by :—* THE EVER READY CO. LTD. — THE CHLORIDE ELECTRIC CO. LTD. THE PERFECT BATTERY CO. LTD. — EVER READY ELECTRIC CARBON LTD.	Per ton. Electric Torches or Lamps; Accumulators and Accumulator Parts; Carbon Dust; Battery Cells; Torch and Lamp Cases; Carbon Plates and Rods; Empties returned to Suppliers.

OFFICIAL NOTICES

Great Western Railway Company

NOTICE IS HEREBY GIVEN that the Annual General Meeting of the Proprietors of this Company will be held in London, at Paddington Station, on Wednesday, the 27th day of February, 1935, at half-past eleven o'clock in the morning, for the general purposes of business.

AND NOTICE IS HEREBY ALSO GIVEN that a Special General Meeting of the Proprietors will be held at Paddington Station on the same day at twelve o'clock noon—or as soon thereafter as the said Annual General Meeting is concluded or adjourned—when the following Bills will be submitted for the consideration and if thought fit, for the approval of such meeting, viz.:—

"A Bill for conferring further powers upon the Great Western Railway Company and for other purposes."

"A Bill to make further provision as to the tolls and charges leviable by the Company of Proprietors of the Stourbridge Navigation; to authorise the transfer to the Company of part of the Stourbridge Extension Canal; and for other purposes."

R. S. HORNE,
Chairman.
F. R. E. DAVIS,
Secretary.

Paddington Station,
London W.2.
11th February, 1935.

London Midland & Scottish Railway Company

NOTICE is hereby given that the Ordinary General Meeting of the London Midland & Scottish Railway Company will be held at Friends House, Euston Road, London, N.W., on Friday, the 1st March, 1935, at 11.30 a.m. precisely, for the transaction of the general business of the Company.

JOSIAH CHARLES STAMP,
Chairman.
OWEN GLYNNE ROBERTS,
Secretary.

Euston Station,
London, N.W.1.
14th February, 1935.

Southern Railway Company

NOTICE is hereby given that the next Annual General Meeting of the Southern Railway Company will be held at Southern House, Cannon Street Station, in the City of London, on Thursday, the 28th day of February, 1935, at 11.30 a.m., for the purpose of receiving the Accounts for the past year and transacting general business.

F. H. WILLIS,
Secretary.

Waterloo Station, London.
11th February, 1935.

South Indian Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of:—

COPPER INGOTS (80 Tons).

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders, addressed to the Chairman and Directors of the South Indian Railway Co. Ltd., marked "Tender for Copper Ingots," with the name of the firm tendering, must be left with the undersigned not later than 10 a.m. on Friday, the 1st March, 1935.

The Directors do not bind themselves to accept the lowest or any Tender.

A charge, which will not be returned, will be made of 10s. for each copy of the Specification.

A. MUIRHEAD,
Managing Director.

91, Petty France,
Westminster, S.W.1.
13th February, 1935.

"IMPROVEMENTS in and Relating to Journal Bearings for Rail Vehicles." The Proprietors of British Patent No. 345,510 desire to arrange for the commercial working of this Patent by sale outright or by licences granted on participating and reasonable terms.—Particulars obtainable from TECHNICAL RECORDS LIMITED, 59-60, Lincoln's Inn Fields, London, W.C.2.

RAILWAY AND OTHER REPORTS

Great Western Railway.—The directors, on February 13, recommended a dividend for the half year ending December 31 of £2 15s. per cent. on the consolidated ordinary stock, making £3 per cent. for the year, the same as that declared for 1933. The gross receipts of the company from railway and ancillary businesses for 1934 were £856,726 or 3·01 per cent. more than for the previous year. The gross expenditure for the year was greater by £340,638, or 1·42 per cent. Miscellaneous net receipts (less charges) increased by £66,350. The net revenue for the year amounted to £5,410,999, an increase of £582,438. The balance brought forward from last year was £40,679, and after including £323,948 in respect of profit on realisation of investments and appropriating £550,000 from the contingency fund, the directors recommended their dividend. The balance carried forward is £43,226. During the year certain reserves, mainly in respect of income tax, which are no longer required, have been realised and transferred to the contingency fund, which now stands at £1,782,476, as compared with £1,822,057 at the beginning of the year. Dividend warrants will be posted on March 4.

London Midland and Scottish Railway.—The Secretary writes, February 13:—"For the year 1934, the company's railway receipts increased by £2,386,000 and receipts from all sources increased by £2,948,000; increases in working expenses amounted to £1,739,000, making a net increase of £1,209,000, the net revenue being £11,921,000. At the meeting of the board on November 29, it was decided to pay the following final dividend:—£3 2s. 6d. per cent. on the 5 per cent. redeemable preference stock (1955), making with the interim dividend of £1 17s. 6d. per cent., £5 per cent. for the year; and at the meeting of the board today, it was decided to recommend the following final dividends:—£2 per cent. on the 4 per cent. guaranteed stock, making with the interim dividend of £2 per cent., £4 per cent. for the year; £2 10s. per cent. on the 4 per cent. preference stock, making with the interim dividend of £1 10s. per cent., £4 per cent. for the year; and a dividend of £1 12s. 6d. per cent. on the 4 per cent. preference stock (1923); carrying forward £20,519 and making no payment on the ordinary stock. The warrants in respect of these dividends will be posted on March 5."

Southern Railway.—The Secretary writes, February 11:—"The directors of the Southern Railway Company have resolved to recommend the proprietors to declare a dividend of 4 per cent. on the preferred ordinary stock for the year 1934 as compared with 3 per cent. for 1933. The balance carried forward is £227,353 as compared with £224,927 carried forward from 1933. It is proposed to make the dividend payable on Tuesday, March 5."

Great Southern Railways.—The Secretary writes, February 8: "The directors of the above company at their meeting today decided to recommend the payment of a dividend on the 4 per cent. guaranteed preference stock for the year ended December 31, 1932, which is in arrear. The dividend is payable at the rate of 4 per cent. per annum on the nominal amount of stock existing prior to the reduction made, pursuant to the provisions of the Railways Act, 1933. The directors regret that no profits are yet available for dividends on the preference and ordinary stocks of the company."

Bengal Dooars Railway.—The directors have declared an interim dividend of 3 per cent. on the ordinary stock, on account of the year ended March 31, 1935, payable, less income tax at 2s. 4d. in the £, on March 28, 1935.

Canadian Pacific Railway.—Following the meeting of the directors on February 12, it was officially stated that no announcement as to dividend would be made until after the March meeting of the Board, at which a full statement of the company's operations for the year 1934 would be presented.

Forthcoming Meetings

Feb. 22 (*Fri.*).—**Mersey Railway,** (Ordinary General), Winchester House, Old Broad Street, E.C. 2, at 12 noon.

Feb. 23 (*Sat.*).—**Great Southern Railways** (Nomination of Directors), Kingsbridge Station, Dublin, from 10 a.m. to 4 p.m.

Feb. 27 (*Wed.*).—**Great Western Railway** (Annual General), Paddington Station, W.2, at 11.30 a.m.

Feb. 28 (*Thurs.*).—**Southern Railway** (Annual General), Southern House, Cannon Street Station, E.C., at 11.30 a.m.

Feb. 28 (*Thurs.*).—**Dundalk, Newry & Greenore Railway** (Ordinary General), Euston Station, N.W.1, at 12.30 p.m.

Mar. 1 (*Fri.*).—**London Midland & Scottish Railway** (Annual General), Friends House, Euston Road, N.W.1, at 11.30 a.m.

Mar. 8 (*Fri.*).—**Great Southern Railways** (Ordinary General), Gresham Hotel, Upper O'Connell Street, Dublin, at 2 p.m.

Mar. 29 (*Fri.*).—**Zafra & Huelva Railway** (Ordinary General), Calle de Ayala 54 Bajo Derecha, Madrid, at 5 p.m.

XUM

Railway Share Market

The stock and share markets have been subject to liquidation in the gilt-edged market and also in other markets where the realisation of stocks has been negotiable without difficulty. It was considered that the declaration of the home railway dividends came at an unfortunate time. Markets generally were subject to a good deal of liquidation, not a little of which was of a forced character; consequently, there was a good deal of marking down of prices by the Stock Exchange dealers. As far as home railway dividends are concerned these would have been regarded as very satisfactory only a few months ago, but they are now said to have led to selling.

Southern preferred ordinary was advanced immediately following the declaration of 4 per cent. for the year as against 3 per cent. for 1933, but the price has since reacted sharply, whilst the announcement on Wednesday of 1⅛ per cent. dividend on London Midland & Scottish 1923 preference stock was followed by a drop in the price. Since the latter stock has been out of the dividend list for some years and at this week's price gives a yield of 3¼ per cent. on the basis of only 1⅛ per cent. for the year, the fall is considered to have been unjustified. Great Western ordinary stock, which has been rising in recent weeks in anticipation of the announcement of 3 per cent. for the whole of the past year, weakened on the actual announcement on Wednesday. The market generally was under the adverse influence of the rise in the unemployed figures, a series of big traffic decreases announced on Wednesday and the surrounding liquidation of a semi-forced character. A change in the trend of the market is anticipated after the close of the current fortnightly account which ends this week. The London & North Eastern dividend announcement is due on Friday next week.

London Transport "C" stock has again fallen and there was a marking down of one to two points in the Board's prior stocks. This reduction in the quotation of debenture and prior lien stocks is in sympathy with the downward movement of gilt-edged securities. Foreign railway stocks were inclined to rise early in the week, some of the Argentine railway ordinary stocks, such as B.A. Great Southern and B.A. Western, showing improvement on the crop prospects and a brighter outlook for peso exchange, but the market was unable to resist the depressing influence of the liquidation in surrounding markets.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1934-35	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1934	No. of Week	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1934	Prices: Lowest 1934	Prices: Feb. 13, 1935	Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	10.2.35	15,030	+ 5,410	6	68,750	70,000	— 1,250	Ord. Stk.	26¾	19	20	Nil
	Argentine North Eastern	753	9.2.35	6,086	— 341	32	232,922	275,933	— 43,011	,,	11	6⅞	7	Nil
	Argentine Transandine ..	111	—	—	—	—	—	—	—	A. Deb.	52	45	50	8
	Bolivar	174	Jan., 1935	5,850	— 700	4	5,850	6,550	— 700	6 p.c. Db.	10	6½	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	13⅝	10 7/16	13	3 15/16
	Buenos Ayres & Pacific	2,806	9.2.35	89,492	— 6,585	32	2,250,095	2,647,281	— 397,186	Ord. Stk.	16½	8½	9	Nil
	Buenos Ayres Central ..	190	20.1.35	$94,100	— $22,500	29	$3,373,800	$3,333,500	+ $40,300	Mt. Db.	23	10	21½	Nil
	Buenos Ayres Gt. Southern	5,085	9.2.35	211,747	+ 2,996	32	4,278,083	5,125,264	— 847,181	Ord. Stk.	35	22	25½	Nil
	Buenos Ayres Western ..	1,930	9.2.35	50,177	— 1,664	32	1,362,215	1,683,766	— 321,551	,,	27½	18½	22	Nil
	Central Argentine ..	3,700	9.2.35	130,452	— 14,660	32	3,753,922	4,394,680	— 640,758	,,	23	13½	15½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	14	7	8½	Nil
	Cent. Uruguay of M. Video	273	9.2.35	17,960	+ 809	32	533,051	522,225	+ 10,826	Ord. Stk.	15½	8	8½	Nil
	Do. Eastern Extn.	311	9.2.35	3,347	— 432	32	112,481	102,384	+ 10,097	—	—	—	—	—
	Do. Northern Extn.	185	9.2.35	2,261	+ 399	32	60,324	55,561	+ 4,763	—	—	—	—	—
	Do. Western Extn.	211	9.2.35	2,381	+ 114	32	48,868	51,232	— 2,364	—	—	—	—	—
	Cordoba Central.. ..	1,218	9.2.35	25,680	— 1,300	32	939,660	1,163,180	— 223,520	Ord. Inc.	6	3	3½	Nil
	Costa Rica	188	Nov., 1934	17,520	— 1,014	17	81,005	99,724	— 18,719	Stk.	30¾	23½	31½	6⅝
	Dorada	70	Dec., 1934	8,100	— 2,900	52	120,900	96,800	+ 24,100	1 Mt. Db.	103	95	102½	5⅞
	Entre Rios	810	9.2.35	12,710	+ 1,099	32	404,102	425,855	— 21,753	Ord. Stk.	21½	12	14	Nil
	Great Western of Brazil	1,082	9.2.35	13,000	+ 1,600	6	67,400	68,800	— 1,400	Ord. Sh.	⅞	5/8	1/2	Nil
	International of Cl. Amer.	794	Dec., 1934	$410,865	— $1,049	52	$4,722,779	$4,537,682	+ $185,097	—	—	—	—	—
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	1st Pref.	1/-	1/-	1/2	Nil
	La Guaira & Caracas ..	22⅝	Jan., 1935	3,100	— 1,300	4	3,100	4,400	— 1,300	Stk.	12¾	7⅝	8½	Nil
	Leopoldina	1,918	9.2.35	21,190	— 6,059	6	138,783	126,550	+ 12,233	Ord. Stk.	14⅝	7	7½	Nil
	Mexican	483	7.2.35	$222,400	+ $33,700	5	$1,218,300	$1,077,500	+ $140,800	,,	3¼	1½	1½	Nil
	Midland of Uruguay ..	319	Jan., 1935	13,282	+ 1,832	30	79,115	68,680	+ 10,435	,,	1½	½	1½	Nil
	Nitrate	401	31.1.35	5,260	— 12,434	4	9,960	133,649	— 23,689	Ord. Sh.	32 9/32	51/-	2⅝	Nil
	Paraguay Central ..	274	9.2.35	5,600	+ 2,980	32	150,730	103,440	+ 47,290	Pr. Li. Stk.	84	67	78½	7⅝
	Peruvian Corporation ..	1,059	Jan., 1935	65,309	+ 6,580	30	436,825	388,420	+ 48,405	Pref.	14½	8	8	Nil
	Salvador	100	2.2.35	¢37,300	+ ¢2,200	31	¢501,252	¢511,433	— ¢10,181	Pr. Li. Db.	75	70	70	7⅛
	San Paulo..	153½	3.2.35	32,665	+ 1,632	5	154,251	145,231	+ 9,020	Ord. Stk.	86	67	66	6 1/16
	Taltal	164	Jan., 1935	3,100	+ 23	30	16,670	15,592	+ 1,087	Ord. Sh.	2⅛	1 7/16	1¾	5 13/16
	United of Havana ..	1,365	9.2.35	47,032	+ 26,515	32	567,998	430,665	+ 137,333	Ord. Stk.	6	2	3	Nil
	Uruguay Northern ..	73	Jan., 1935	1,152	+ 230	30	8,446	8,305	+ 141	Deb. Stk.	6¼	3	5½	Nil
Canada.	Canadian National ..	23,735	7.2.35	600,058	+ 67,857	5	3,022,115	2,844,717	+ 177,398	—	—	—	—	—
	Canadian Northern ..	—	—	—	—	—	—	—	—4p.c.	Perp. Dbs.	78¼	51½	68½	5 13/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104½	97¼	100½	4
	Canadian Pacific ..	17,211	7.2.35	436,400	+ 5,400	5	2,089,600	2,225,000	— 135,400	Ord. Stk.	18 5/16	11 1/16	13	Nil
India.†	Assam Bengal	1,329	12.1.35	27,787	+ 3,561	41	1,102,821	964,003	+ 138,818	Ord. Stk.	88½	72	87½	3 7/16
	Barsi Light	202	19.1.35	2,692	+ 375	42	113,685	120,877	— 7,192	Ord. Sh.	104½	98¾	104½	5¾
	Bengal & North Western	2,113	19.1.35	52,604	+ 15,513	16	745,949	747,830	— 1,881	Ord. Stk.	297½	262	294½	5 7/16
	Bengal Dooars & Extension	161	19.1.35	3,153	+ 396	42	126,771	126,082	+ 689	,,	125¼	124	126½	5½
	Bengal-Nagpur	3,269	5.1.35	115,725	— 29	40	4,409,897	4,110,477	+ 299,420	,,	105½	96	104½	3 15/16
	Bombay, Baroda & Cl. India	3,072	2.2.35	201,150	+ 22,875	44	6,844,050	6,504,450	+ 339,600	,,	115	108½	114½	5¼
	Madras & South'n Mahratta	3,230	19.1.35	92,625	— 5,793	42	4,433,388	4,500,215	— 66,827	,,	131	122¾	127½	7 1/16
	Rohilkund & Kumaon ..	572	19.1.35	11,359	— 442	16	149,320	139,665	+ 9,655	,,	263	250	271½	5⅞
	South India	2,526	12.1.35	75,728	+ 2,672	41	3,244,530	3,184,491	+ 60,039	,,	119	115	116	6⅞
Various.	Beira-Umtali	204	Nov., 1934	64.355	+ 14,678	9	125,490	99,606	+ 25,884	—	—	—	—	—
	Bilbao River & Cantabrian	15	Jan., 1935	2,249	+ 702	4	2,249	1,547	+ 702	—	—	—	—	—
	Egyptian Delta	621	31.1.35	8,081	— 146	44	203,124	199,295	+ 3,829	Prf. Sh.	21 3/16	1¾	2⅝	4¼
	Great Southern of Spain	104	2.2.35	2,098	+ 292	5	10,797	11,322	— 525	Inc. Deb.	4	3½	3½	Nil
	Kenya & Uganda ..	1,625	Dec., 1934	196,966	+ 41,493	52	2,227,178	2,088,162	+ 139,016	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	50	33	47	7 7/16
	Mashonaland	913	Nov., 1934	115,238	+ 23,474	9	232,511	186,337	+ 46,174	1 Mg. Db.	101	91¾	103	4⅞
	Midland of W. Australia	277	Dec., 1934	14,518	— 767	26	85,947	80,396	+ 5,551	Inc. Deb.	100	93	96½	5 5/16
	Nigerian	1,905	22.12.34	69,247	— 2,629	38	1,355,345	1,145,724	+ 209,621	—	—	—	—	—
	Rhodesia	1,538	Nov., 1934	185,477	+ 29,280	9	375,036	316,298	+ 58,738	4 p.c. Db.	104⅞	97½	105	3 15/16
	South African	13,217	19.1.35	541,478	+ 73,368	42	21,611,536	19,027,940	+2,583,596	—	—	—	—	—
	Victorian	6,172	Oct., 1934	893,146	+ 75,686	17	3,032,823	2,938,131	+ 94,692	—	—	—	—	—
	Zafra & Huelva	112	Dec., 1934	10,586	— 141	52	138,474	134,554	+ 3,920	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.
† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador receipts are in currency.
The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value